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CROP GEOGRAPHY IN RELATION TO ENVIRONMENT

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The boundaries of crop distribution and plant adaptation generally recognised by agricultural geographers are usually based on length of frost-free season, isotherms, isohyets, seasonal distribution of rainfall, availability of soil moisture and aeration, and similar natural phenomena. During recent decades, however, there has been an increasing accumulation of data from scientific experiment and practical experience on the reaction of plants to their environment, and on the effects of variously manipulated environments on the growth and reproductive capacities of the plants so treated. These data have shown that there are certain of the factors of the environment which play a decisive rôle as far as the change from a vegetative to a reproductive condition is concerned, and that the environmental factors usually regarded as dominant in this respect probably play only an accessory part.

In order to appreciate this point of view, it is necessary to accept the obvious fact that all crops are at the time of harvest or utilisation the result or manifestation of different degrees and combinations of growth and development. The cereals and other crops in which the seed or fruit is the economic product are characterised by a completion of all reproductive processes. Crops in which the foliage or the root is the economic end product depend more on growth than on development for their optimal yield. The leafy strains of herbage plants have been selected because they exhibit maximal growth for the species concerned, although their ultimate yield, and particularly their high nutritive value, depend upon the progress of development up to a certain stage. Agronomic practices in different environments, and particularly in different latitudes, have generally been empirically adapted to ensure that conditions are optimal for those physiological processes concerned in producing the economic returns required, whether of grain or cut green fodder, grazing pastures, green vegetables, root crops, green manure, tobacco, or timber.

Throughout the literature on this branch of biological research, which has become known as 'development physiology,' the terms 'growth' and 'development' are used in a restricted sense which requires definition. Growth is the accumulation of dry matter or increase in size of a plant,

development the progress towards ultimate reproduction by externally recognisable or invisible stages. The change from a state of pure growth to that of development combined with growth (the equivalent of puberty in animals) is carried through under the influence of the factors of the environment. The decisive factors which control growth and development are temperature and light (its presence or absence) ; once these factors have had an opportunity of operating at the appropriate time and to the required degree, a further set of conditions, including water relations of air and soil, general internal metabolism of the plant, and nutrient status of the environment can then operate and determine whether a plant shall ultimately be permitted to exhibit the vegetative growth or reproductive status already latent within it. This is an over-simplified statement of complex biological problems which are considered in more detail elsewhere.[1]

Plants vary widely in their capacity to react to the environment, and in their need for precise doses of one or more factors before they can proceed to reproduction. The different strains of economic plants, or the ecotypes of wild species found in the natural vegetation, are expressions of the degrees to which the particular strain or ecotype concerned is adapted to the environment in which it is found, for the purpose of optimal growth or development. The breeding of leafy ' pasture ' or ' hay-pasture ' strains of herbage plants is based on the selection from a mixed population of types which do not find their environment quite optimal for the complete achievement of reproduction, and therefore tend to remain largely or partially vegetative and hence of greater ' pasture ' value. Some crops or wild plants which are found over a wide range of latitude are not restricted in their requirement for temperature or appropriate length of day for sexual or vegetative reproduction ; or, alternatively, some species possess within their populations a wide range of ecotypes with different environmental requirements, any one of which may take part in a migration, accidental or under the direction of man, to a new environment.

The two main branches of research on the manipulation of a plant's environment have been concerned with vernalisation and photoperiodism. The term vernalisation was coined as the English equivalent of the Russian term, jarovizacia, which was applied by workers in the Soviet Union to a special technique evolved at Odessa on the basis of a similar chilling technique produced many years previously in Germany. Vernalisation means the exposure of slowly growing seed to the degree and duration of low temperature which that particular variety would experience and would require if sown in the open. The degree and duration of the treatment depends upon the ' winterness ' of the variety. The idea is that winter varieties may be given their ' winter ' in the laboratory or the barn, and then sown in spring when conditions for sowing or cultivation may be more favourable. This method had a ' fashion ' some ten years ago, and acquired a considerable propaganda value in the Soviet Union. That phase is now past, and the interest has centred more on the very detailed scientific investigation of the fundamental biological processes involved in the phenomenon carried out at the Research Institute of Plant Physiology at the Imperial College of Science and Technology, London.[2]

One of the more important practical results obtained concerns the fact that development is a reversible process, and that it is possible to ' devernal-

ise ' vernalised grain of winter rye, for example, by drying, or exposure to high temperature, or to anaerobic conditions. When devernalisation has been wholly or partially completed, it is then possible to induce vernalisation again by exposure to the requisite environment. This is important as far as natural vernalisation in the field is concerned (a process to which all winter varieties are naturally exposed every winter, either in the form of slowly germinating seed or as young seedlings). If the temperature in the field in winter or early spring were to rise sufficiently to produce partial devernalisation, and the seeds or seedlings were to be vernalised again by a subsequent cold spell, a delaying effect would probably be produced on the ultimate time of flowering. Similar irregularities might be produced by the existence of totally or partially anaerobic conditions during a wet winter in a sodden clay soil ; a state of partial vernalisation in seed sown in such a field during an earlier part of the season and later exposed to natural vernalising temperatures might be annulled by a subsequent period under anaerobic conditions.

Another significant point arising out of the research on vernalisation is the fact that a developing seed of winter rye, for example, acquires the capacity to respond to the temperature of its environment five days after fertilisation—that is, while still attached to the mother plant. This capacity is progressively lost as the seed matures and enters a dormant condition, to be reacquired when germination brings renewed activity. Thus, the temperature at which the grain forms and ripens on the mother plant affects the earliness of next season's crop. Seeds from northern latitudes brought to the south and sown alongside seed of southern reproduction will be earlier, but are also likely to be less winter-hardy in the south, since it is found that plants may lose their winter hardiness when their requirement for low temperature has been met (on the mother plant in the north).

The research on photoperiodism originated in the experiments of Garner and Allard at Arlington, Virginia, and has led to a very large number of experiments in all parts of the world on the reaction of plants to different alternations of day and night, and to the classification of plants into long-day types (those flowering in northern latitudes), short-day types (those of tropical and subtropical latitudes), and other indeterminate and intermediate classes. In its original form, photoperiodism was understood to entail a regular alternation of light and dark periods, but the rigidity of this alternation is not now accepted. An alternation of light and dark periods is apparently not essential for at least some of the long-day plants, as development is possible even if these are grown in continuous light. It would appear that darkness is an inhibiting influence in the development of long-day plants. Research on short-day plants does not yet show definitely that the converse is true for short-day plants, namely, that these require darkness for development and only tolerate light. The situation here is complicated by the fact that development is not possible without growth, and growth requires a minimum number of light hours for photosynthesis. American and Russian work is indicating, however, that in short-day plants it is darkness and not the photoperiod which activates development, and that it is not the magnitude of the proportion between daily darkness and light but the absolute length of the dark period which is important.

From a geographical point of view it is difficult to understand how there

can be two such distinct types of plants, one dependent on light for development and the other on darkness, when it is recognised that the photoperiodic classes are related to latitude ; just as plants are found in every latitude from the northern limit of vegetation to the equator, so there exist all types of photoperiodic conditions from long days to short days. Upon what does development in the intermediate latitudes depend ?

So far we have referred to the importance of temperature as a decisive factor only in the early stages of a plant's life. An important development in the study of light as a decisive factor is that investigators of photoperiodic reactions, and particularly of the classification of plants into short-day, long-day and other groups, have now recognised that the placing of a particular plant in any of these classes is dependent upon the age of the plant and particularly upon the temperature obtaining at the time of the experiment. It does not necessarily follow that the photoperiodic behaviour of a plant will be the same under a different, even a slightly different, temperature.

Suggestions are made from time to time regarding the desirability of collaboration between meteorologists and plant scientists or naturalists in making phenological observations on the relation between weather or climate and the behaviour of plants. It is gratifying to record that the British Ecological Society and the Royal Meteorological Society held a joint meeting on May 15, 1946, to discuss " Ecology and the study of climate." Many of the records which it is suggested should be made are connected with the processes of reproduction of a plant as expressed morphologically in such recognisable phenomena as shooting, flowering, seed formation, and so on. The usual types of meterological data do not, however, generally provide the necessary information for a correlation between seasonal trends in the environment and the growth or flowering behaviour of a plant. If it is finally agreed among plant physiologists which factors of the environment are decisive in affecting growth and reproduction, the taking of records can presumably be adapted accordingly to give the total number of hours below or above a certain temperature, the duration of light periods or darkness, or the duration of light of the particular intensity effective for reproduction (down to bright moonlight, according to some workers). Above all, however, the recording of microclimates or local climates at plant height or within a plant stand is essential, as at that height are to be found the leaves and growing points which are the receptors of the factors of the environment.

What is probably the first complete control of all environmental factors to be achieved is that of the experiments at the California Institute of Technology, Pasadena, where special air-conditioned greenhouses have been erected. Research at Pasadena began with the determination of optimal growing conditions, but in the course of this work on tomatoes and Californian annual plants it was discovered that a subjection to different day and night temperatures gave better growth than the maintenance of a constant temperature. Humidity, length of photoperiod, light intensity, mineral nutrition, root temperature, watering, root medium, etc. could be varied within comparatively wide limits without significantly changing the rate of stem elongation and the setting of fruit. On the other hand, small differences in the temperature of the environment caused significant

differences in growth and set of fruits. Closer analysis revealed the phenomenon of thermoperiodicity ; optimal growth and development occur in tomatoes when the temperature during the dark night period is lower than during the daily light period. The name, thermoperiodicity, has been proposed by the workers at Pasadena to include all effects of a temperature differential between light and dark periods on responses of a plant, whether they be flowering, fruiting, or growth.

Even with this very superficial survey of a large and complex subject, it can be seen that the applications and implications are quite fundamental as far as practical agriculture and horticulture are concerned. A warning must be uttered at this stage, however, that no great and immediate introduction of new agronomic methods of artificial manipulation of the environment is to be expected. Farmers and agronomists concerned with the cultivation of crops under difficult environments have expected much from vernalisation as a method of reducing the time a crop spends in the ground, thus making it possible to avoid severe winter cold or waterlogging, or excessive summer heat and drought. The more reliable methods are still, however, the choice of varieties adapted to the conditions, or the breeding of superior varieties.

Variations in plant behaviour from one season to another may ultimately be explained on the basis of developmental physiology. Early and late strains of, say, a clover may vary by 14 days in their time of flowering. In an early year the early strains may flower on the 1st of a month and the late on the 14th, with intermediate types on intervening dates. In a late year, when all seasonal botanical phenomena are a fortnight later, the early, intermediate and late strains will still flower in the same order, having all been exposed equally to the decisive factor of the winter or spring environment which caused the later season.

Timothy (*Phleum pratense*) is a well-known grass in Scotland which has a wide latitudinal distribution. For this reason, the results of a co-operative experiment in U.S.A. and Canada may be of interest. Two American and one Canadian worker investigated the flowering behaviour of a number of strains of timothy, selecting thirteen strains showing fairly uniform gradations from very early to very late, and growing them at three stations at different latitudes :

Washington, D.C. .	38° 54′ N.	Altitude 50 ft.
North Ridgeville, Ohio	41° 23′ N.	Altitude 750 ft.
Guelph, Ontario .	43° 33′ N.	Altitude 1120 ft.

The plants of each strain had been propagated vegetatively from the same original plant, to avoid the possibility of genetical differences between them if they had been grown from seed. The dates (in 1933) when the first florets bloomed on the timothy plants are tabulated on page 54.

All but three of the strains conform to Hopkins' Bioclimatic Law, which states that, if other conditions such as those relating to longitude, altitude, distance to large bodies of water, and other factors which may have an effect on local climates are equal, then the time of flowering, or any other periodic event in the spring, should progress from south to north (in the northern hemisphere), over the entire range of latitude where any species of plant under consideration may grow, at the uniform rate of

Strain number.	Washington, D.C.	North Ridgeville, Ohio.	Guelph, Ontario.
19456	May 27	June 5	June 20
19458	June 2	June 8	June 20
15092	June 6	June 10	June 22
11902	June 8	June 12	June 25
6127	June 13	June 16	June 25
6743	June 14	June 22	June 28
9220	June 23	June 27	June 28
12421	June 28	June 29	July 3
15485	July 3	July 4	July 8
19416	July 10	July 5	July 6
15445	July 13	July 10	July 7
19459	July 25	July 15	July 8
19460	July 31	July 22	July 15

one-fourth of a degree of latitude each day. But in the latest three selections, the season for heading and flowering progresses from north to south. The following is the explanation suggested by these transatlantic investigators : " In very early strains heads develop and the flowering process occurs with days 10 to 12 hours long. In strains which are later under natural conditions, longer days are required for these processes, if the plants are grown under days artificially made of uniform lengths. At the southern station where this experiment was conducted, the lengths of day during late spring and early summer are not as great as at the stations further north. For the earliest strains, the lengths of day at the southern station are sufficient for the development of heads to begin before the temperature becomes high enough for active growth at the stations further north. In the case of very late strains of timothy, on the other hand, length of day apparently is the limiting factor at the latitudes where this experiment was conducted. Since the minimum length of day in the spring is attained, in the northern hemisphere, at stations which are relatively far north sooner than at stations further south, the season for heading and flowering of those very late strains of timothy consequently progresses, in the latitudes where this experiment was conducted, from north to south." The situation is elucidated further in Fig. 1, based on results from a later season.

It would be interesting to make a similar study in Great Britain with a plant with a similar range of types from early to late, although the latitudinal range available would not be so wide as that in Fig. 1. It would also be desirable if investigators breeding new strains for earliness or lateness were to study the segregation of the material throughout the complete latitudinal range of the species, as one of the factors in one environment may operate in such a way as to mask the true physiological, and therefore genetical, nature of the material.

This is only a superficial review of what is developing into a very large subject, but it will be obvious from what has been said that there is in the future considerable scope for collaboration between plant biologists and geographers, particularly those geographers concerned with analysing the

environment. As data accumulate and fill in the gaps or correct the misinterpretations in our knowledge, we shall be much nearer to an under-

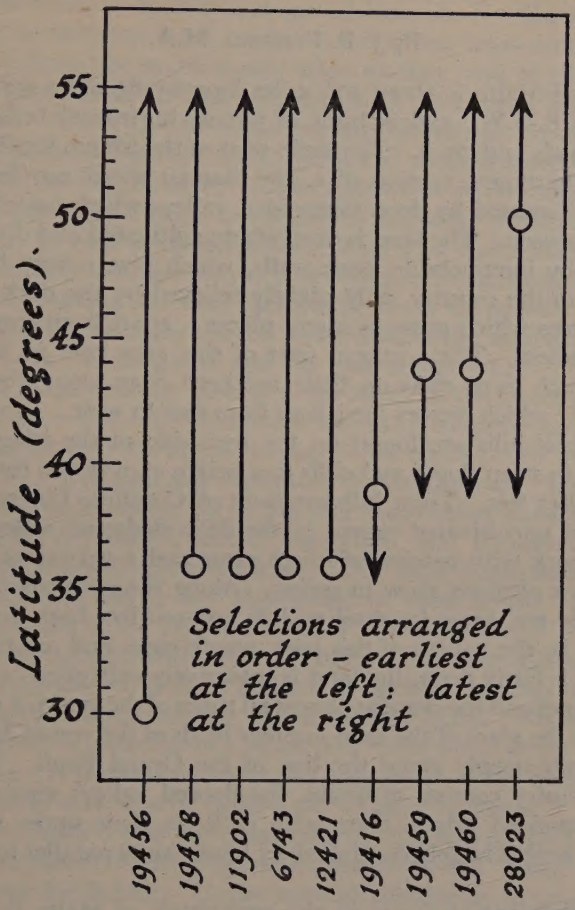

Fig. 1. Progress of the 1935 season for blooming of different selections of timothy. The latitude where each strain began to bloom is indicated by the circle. For the earliest strains, at the southern border of the timothy-growing area in the northern hemisphere, the days are sufficiently long for development of culms and inflorescences when or soon after the weather has become warm enough for spring growth. For these early strains, the season for heading, blooming and maturing progresses northward at a gradually accelerated rate as the season advances. A medium maturing strain such as 6743 shows at first a delay in the season for heading, blooming and maturing, after temperatures are suitable, until the days become of sufficient length; eventually the season begins at the southern border of the timothy area, progressing northwards, at first slowly and then at a constantly accelerating rate. The late strains are even more delayed. Plants begin to bloom not at the southern border of the area, but at a latitude where suitable temperatures and daylengths first occur. The season for blooming then progresses in both directions—towards the north as the temperatures become higher, towards the south as the days lengthen. (Evans, 1939.)

standing of the behaviour of plants in relation to geographical location, whether expressed in terms of seasonal or diurnal variations of light and temperature, or of latitudinal or altitudinal range, or other factors.

[1] Whyte, R. O. *Crop Production and Environment.* London: Faber and Faber Ltd. 1946.

[2] —— "History of Research in Vernalisation." *Chronica Botanica* (in press), 1946.

NOTES ON RURAL MALTA

By J. B. Fleming, M.A.

The Island of Malta is about 17½ miles long by 8½ miles across, the long axis lying N.E.-S.W., and is built of almost horizontal beds of Tertiary limestone, sands and clays. The main part of the island, south and west of the Valetta harbours, consists of a low plateau about 200 feet above sea level, much dissected by deep steep-sided valleys which have streams only in the rainy season. The land is everywhere cultivated and divided up into small fields by innumerable stone walls, which give a very barren, stony appearance to the country, only slightly relieved by the dark green of the low carob trees which grow in many places ; apart from these the island is almost treeless. The northern part of this area rises to hills of about 400 feet, which form cliffs on their northern edge along the line of the Grand Fault [1] which crosses the island from east to west.

The highest hills are found on the west side of the island where the ground rises in steep slopes and cliffs to a height of over 700 feet, the highest point being 845 feet. These hills are built of Coralline Limestone, [1, 2] and are bare and uncultivated except in the deep sheltered valleys. There is much bare rock with patches of rough grass and a variety of wild flowers which make a pleasant show in spring. Along the west coast the hills fall steeply to the sea, some impressive cliffs 300-400 feet high dropping sheer to the sea. In the valleys of this part, where clays and marls are exposed and the soil is fairly deep, the land is intensively cultivated, and the green of the fruit trees and the crops at almost all times of the year is a very welcome change from the glare of the bare summer fields of the rest of Malta. These hills also drop steeply along the line of the Grand Fault. North of the fault the country consists of broad, flat-floored valleys separated by flat-topped, steep-sided ridges, often with cliffs on their upper slopes. The topography here is largely controlled by lesser faults parallel to that already mentioned.

The predominating factor in the agriculture of Malta is the necessity for careful soil conservation. The soil, which is reddish-brown on the sands and clays and light brown to grey on the limestones, is naturally very fertile, being particularly rich in phosphates. It is, however, very thin except in a few favoured valleys, and this, combined with the powerful erosive action of the heavy winter showers, necessitates elaborate measures for its protection. All the slopes are carefully terraced by stone walls which vary in height from a few inches to seven or eight feet. These enclose narrow strip-like fields varying in width according to the slope. Even slopes that are almost vertical are terraced, and little patches of soil on cliff ledges only a few yards across are carefully walled and cultivated. On the flatter lands the fields are still small and surrounded by stone walls, the only exceptions being on the Marsa lowland and in the northern valleys where considerable areas of alluvium occur and where the fields are larger.

The farmers go to endless trouble to collect soil from odd pockets or hollows and to transfer it to their fields in baskets. Where quarries are worked, as in the Gharghur area, the soil is first removed from the surface

and carefully preserved until the quarrying operations are completed. The bottom of the quarry is then levelled off with waste stone chips, and the soil is carried down in baskets and spread over the levelled surface. The field, in fact, is recreated some twenty to thirty feet below its original level. These quarry fields are much sought after, as they tend to retain moisture and are less likely to suffer from drought than the normal fields. To conserve soil, all workers in the fields go bare-footed, as boots carry away considerable quantities of soil ; cart wheels and ploughs are always carefully scraped before leaving the field. There appears to be no reliable confirmation of the legend that large quantities of soil were formerly brought to Malta by sea. In view of the magnitude of such an undertaking it certainly seems most unlikely, and the story is probably merely an exaggeration, based on the habit of moving soil from place to place on the island.

The availability or otherwise of water divides the agriculture into two contrasting types, on irrigated and on unirrigated land. The irrigated land is found mainly in the valleys of the north of the island and in those in the hills of the west coast. There are also small irrigated gardens in other parts of the island, and the Marsa, in peace-time a golf course and recreation ground, has been irrigated and cultivated during the war. The cultivation of this land is very intensive, three and four crops being obtained in a year. The main crops are wheat, maize, vegetables, and tomatoes, with many fields of vines, melons, and pumpkins. The most important orchards of orange, lemon, and peach are also found in these areas. The water is supplied from wells in the Upper Coralline Limestone series. Wind pumps are used widely, together with a few oil engines, but older methods of raising water are very common, such as a chain of buckets operated by a horse or mule, or even the simple hoisting of a bucket by hand. Whatever method is used, the water is collected in a stone tank from which stone troughs take it to the fields. It is usual to water the crop twice a day during the early part of its growth and once or twice a day in its later stages.

One or two crops a year are obtained from the non-irrigated land. The main crops are wheat, barley, vegetables, tomatoes and ' sulla,' a large type of clover grown for fodder. Under normal conditions, large quantities of onions and potatoes are grown for export, but owing to the lack of seed, which must be renewed each year, very few were grown during the war. Although this land is not irrigated, the crops, especially tomatoes, are often watered by hand if a well is available near by. By the road-sides and in a corner of most of the fields, carob trees are grown, the beans being used for fodder for horses. Fertilisers are much used on both irrigated and unirrigated land, manure and night-soil being supplemented in normal times by imported chemical fertilisers.

The agricultural methods used are primitive, but very well adapted to the conditions. The main implements are the hoe and a light wooden plough with a steel tip. This plough is pulled by a horse, mule, or cow, and is pressed into the ground by the farmer. It does not turn over the soil but only scrapes the surface. Government-owned steel ploughs and tractors are in use in some parts of the island, but can only be used where fields are large and soils deep, elsewhere the wooden plough is the only possible implement. By far the greater part of the work in the fields is done with the hoe. It is used as a spade, for weeding, spreading manure, breaking up the

ground, and for many other purposes. The grain and fooder crops are normally cut with a sickle and bound into sheaves by hand. There is room for improvement in the method of threshing, which is still almost universally done on a threshing floor in the open fields. A horse or cow, sometimes dragging a spiked roller, is driven round and round on the grain which is then winnowed by hand. This is a very wasteful process, and attempts are being made to supersede it by the introduction of a Government threshing machine, but at the moment most farmers seem disinclined to use this. The other important implement owned by the farmer is his " gate-cart." This is a flat two-wheeled cart drawn by a horse or mule and, apart from the buses to Valetta, it is the universal method of transport in the country districts.

Goats for milk, and horses, mules, or donkeys for draught are the most important animals kept. There are also a few goat-like sheep kept for their milk and wool, and most farms have a few hens. Goats are seen everywhere ; every farm and indeed almost every house has some, while there are also large commercial herds. Through the Government Milk Marketing Undertaking, the distribution of milk in the towns is controlled and the milk is pasteurised. In the villages, however, it is still a very common sight to see the goats being milked at the house doors. There are a few cattle on the island, and attempts are being made to improve the breed. They are large fawn-coloured beasts with large bones and little flesh and are used for draught work as well as milk production. The animal fodder grown on the farms is normally supplemented by imported feeding stuffs, and the lack of these during the war necessitated the killing off of a large number of beasts, particularly goats.

The farms vary very much in size according to the quality of land. The actual amount of land worked by any one particular farmer is very difficult to discover, as it is almost always in patches which may be quite a distance apart. Paid farm labourers are very rare, and the working unit is the family. The man will plough and the children tend the goats, while the whole family works together at weeding and harvesting.

Malta is an island of towns and large villages, and isolated farms are found only in a few areas. About forty per cent. of the population live in the towns grouped round the Marsamuscetto and Grand Harbours ; almost all the remaining inhabitants are grouped in about twenty-five large villages. The villages are very similar in appearance and layout. There is a central square, dominated by the large parish church, a building usually twice the height of any other in the village, and a number of narrow radiating streets. The houses are of one or two stories, often built round a courtyard, and those of the farms have sheds for carts and animals on the ground floor and a loft for grain or fodder crops above. Very few houses outside the towns have a piped water supply, and water is obtained from a well in the courtyard or, more commonly, from the village pump. Refuse and excreta, both animal and human, are removed by carts and used as fertilisers.

Apart from the Church, which plays a leading part in the life of the community, the most important centre of village life is the " Band Club." Every village has its brass band which leads all the village " festas " and which takes part in frequent contests, and the club with which it is connected is the social centre of the village. At the formation of the National Assembly

about two years ago, a British newspaper commented unfavourably on the fact that the Band Clubs had a larger representation than the Trade Unions. In fact, these clubs are by far the most representative institutions on the island. While the Trade Unions represent only a section of the people, almost every man is a member of his local Band Club.

Single, dispersed farms are found in those parts of the island where water is more easily obtained and so are confined almost entirely to the areas of irrigated land. In these areas, too, the more intensive working of the soil necessitates the farmer being nearer to his fields. The farms are substantially built on two sides of a walled courtyard. The family living quarters are on the upper floor, usually with the rooms opening off an open stone balcony, and the animals, implements, and fodder are kept below. The size of the building varies, as extra rooms are often added on the roof or at the side as required. The farm buildings are surrounded by groups of prickly pears and carob trees which make a pleasing contrast with the bare white walls.

The buildings both in the villages and farms are constructed of a calcareous sandstone quarried from the globigerina limestone group. This is a freestone with no cleavage planes, light in weight and whitish-yellow in colour. It is very easily quarried and cut, and is worked more like wood than stone, with saw and axe. Its main drawback is its tendency to weather rather rapidly. Wood is very scarce, and its use is avoided wherever possible. Two or three beams only are found in a normal house; these are set about three feet apart along the length of the building and the gaps between them are filled by planks of stone about three feet long, this being the maximum length that will bear a weight satisfactorily. The roof so formed is made water-tight by a covering of stone chips and clay beaten hard by hand. This is done by women, and is notable as one of the very few wage-earning occupations in which they are engaged. The houses thus built are very cool in summer but, owing to the porous nature of the stone, tend to be damp and cold in winter. The high cost of fuel must accentuate this drawback. Cooking throughout the island is done almost exclusively on paraffin stoves, though this is sometimes supplemented by a fire of sticks burnt in a small stone brazier.

The country people are usually taller and leaner than the townsfolk of the island, and quite a number of them have blue eyes, which are very rare in the towns. They are a cheerful, friendly people and, though shrewd in their dealings, are kindly and helpful. Very few of them speak any language but Maltese, though some know a few words of English, and many can neither read nor write. This is being altered slowly, though both schools and teachers are still too few in number. The Army has done excellent work in educating those conscripted, first to read and write in their own language, and then in English.

Malta's great problem is over-population. With some 250,000 people and a density of almost 1500 per square mile it is by far the most densely peopled area of Europe. The birth-rate is high and eight or ten children are usual in a family, while families of fifteen or more are quite common. With better medical and health facilities, the death-rate is falling and the chances of survival for children are increasing. The agricultural products of the island can only feed about one-quarter of this rising population, and

Malta has few exports. The necessary food imports are paid for mainly by wages paid by the Naval dockyard and other service departments, and to a small extent by remittances sent home by Maltese who have emigrated. The Government experimental farm is very active in developing new crops and in improving stock and methods of work. But the land, in spite of all improvements, cannot support many more people than at present.

There is little chance of any considerable industrial development on the island, and the only other source of income which might be exploited is the tourist industry. It should be possible to develop this to some extent. While, of course, unable to compete with the Mediterranean resorts of France and Italy, Malta has attracted great attention during the war and it is likely that a number of people will desire to visit it. Before the war, the absence of a good modern hotel must have been a great drawback, though one was in course of construction in 1939, which, when completed, will fill this gap. Previously, most of the tourist trade consisted of catering for day visitors from ships, motor tours round the island, and the selling of lace and souvenirs. Sometimes more than this might well be developed, particularly in spring and autumn when the climate is at its best.

In spite of any such improvements and developments, it seems certain that, if any increase in the general standard of living and in social conditions is to be achieved, some reduction of the population by emigration is essential. A Government scheme of educational and vocational training for intending emigrants has been in operation for the last year, and there are many young men who are keen to go abroad, preferably to Canada or Australia.

Politically, the future is dominated by the promised re-granting of self-government, suspended in 1936. A National Assembly, representative of all sections of the community, has been in existence for some time, and has as its object the producing of a draft constitution, but progress has been slow. The problems of taxation and finance are the main stumbling blocks; it is difficult to see how Malta can ever be economically independent of the expenditure of the service departments. The Trade Unions and political parties are developing a sense of responsibility and are undoubtedly determined to make the most of the opportunity of self-government when it comes.

As regards the peasants, they are in general conservative, and seem much less enthusiastic about the question of political independence than are the townspeople and dockyard workers. It is impossible to say what the results of self-government will be, but the problems a Maltese government will have to face will not be easy, and the way in which it tackles them will be of importance to the British as well as to the Maltese people.

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BRIG O' TURK

LOCH
VENNACHAR

Photo by

BRIG O' TURK—A HIGHLAND ASPECT

By Swanzie Agnew

In the narrow compass of the Trossachs region, with Brig o' Turk as centre, nearly every aspect of Highland life is represented. As a tourist centre the district is one of the most frequented in Scotland, and the amenities have been fostered by the Glasgow Corporation Waterworks Department and by the Forestry Commission who hold much land in this area. The sheep farm, the shooting, the deer forest, the croft, the forest plantation, the water reservoirs, and the tourist industry are facets of an uncoordinated economy to which the community has tried to adjust itself; and the aspects of that adjustment give scope for study and comment for all who are interested in the Highlands and Highland problems.

The setting is that of the west-east depression in which lie Lochs Katrine, Achray, and Vennachar. There is no comprehensive name current for the whole length of this country, for topographically and historically it is not a unit. The tangle of hills and crags forming the Trossachs stands as a divide between the essentially Highland Strath Gartney of Loch Katrine-side and that part to the east which has direct access to Callander and the currents of Lowland life. Ben Venue, flanked by Loch Katrine, stands as a sentinel between these two disparate parts. This mountain and its prolongation into the Trossachs barrier is composed of hard schistose grits impregnated with quartzite which have withstood the attacks of erosion. From this resistant stone all the major peaks of this part of the Highland edge are fashioned—besides Ben Venue, the names of Ben A'an, Ben Ledi, and Ben Vorlich are familiar.

So resistant are these grits that, where they barred the passage of the ice sheet or valley glacier, the power of the ice flow was checked rather in the manner of a wave coming against a rocky headland. However, the momentum of ice movement was not altogether stopped, and the evidence of these conflicting forces may be seen in the hills of the Trossachs barrier which are smoothed and rounded where the impact of the ice was fullest, and steep and craggy on the further side where the ice, in its passage, plucked and carried forward with it loosened rock masses.

Immediately to the east of the Trossachs proper, soft weak strata (slates and phyllites) of Strath Gartney reappear, and there the ice-flow, with renewed power, dug into the old valley floor and gouged out the basin in which Loch Achray lies.

To the south of Achray the ice over-rode the countryside, smoothing here, plucking there, scouring elsewhere—so that to-day lochans or peat marsh fill the hollows, and craggy knolls cap the inclined shelf that carries the road to Aberfoyle. To the north of Achray the grits remain constant and their narrow shelves succeed one another up the slope, each bounded by precipitous rock faces. This side, with its southern exposure, could not readily be cultivated; instead, the slope has remained in natural oak forest to the present day. The gentler slopes on the Aberfoyle side, ill drained and with a northern aspect, are little suited to crofting but are now being made productive by the Forestry Commission.

Loch Achray is but two miles long, for the scouring power of the ice-flow was again checked. Where the hamlet of Brig o' Turk stands, the first major lateral valley—Glen Finglas—enters at right angles to the main valley. In the ice age, the flow of this tributary ran counter to that of the main ice stream, and in consequence the erosive power of both was weakened. The power of the main flow was further reduced at this point by the occurrence of a series of narrow outcrops of the same hard quartzitic grit that characterises the Trossachs area. These outcrops the glacier failed to subdue, and they were left to bar the exit of Loch Achray and to stand to-day as low oak-crowned ridges between which winds the Black Water carrying the overflow of Achray on to Loch Vennachar.

At the mouth of Glen Finglas the tributary ice stream, stemmed in its advance southwards, gave way to the major force and therefore spread laterally, as the glacially levelled shelves and outflow channels on the slopes above the hamlet bear witness. At the same time the slowing of the momentum of the glacier caused it to deposit much of its morainic material. The deepest and most widespread till is to be found mantling the western spurs of Ben Ledi where Glen Finglas changes its direction towards its headwaters in the north-west. Furthermore, the considerable Casaig burn enters just at this point, and the waste material brought by this tributary in the ice age, along with the difficulties experienced by Glen Finglas glacier in changing direction, no doubt account for the greater glacial deposition here. This deposition was sufficient to form a barrier across the valley behind which the headwaters were impounded. The lake was rapidly filled in, particularly at its lower end where the Casaig enters directly from its mountain course. This stream, continuing to deposit its load, has built up a considerable alluvial cone of reassorted drift which to-day forms the only well-drained arable land in upper Glen Finglas.

Beyond the barrier, the post-glacial river immediately began cutting down into its bed in the attempt to reach the level of the main valley, which, over-deepened in the ice age, has always stood at a lower level in relation to its tributary draining Glen Finglas. In consequence a magnificent gorge has been carved, so narrow as to be easily spanned by a foot bridge and yet enclosed by rock walls some 50-100 feet in height. Through this constricted and deeply pot-holed channel the river surges in time of spate. The gorge, made yet more attractive by the growth of natural oak woods intermixed with larch and pine, is one of the beauty spots of the district and attracts many visitors.

The Turk, as the river is called in this lower reach, heavily laden with sediment, issues into the Black Water. Much of the load is dropped, and so the upper end of Loch Vennachar, once no doubt island-studded, has been gradually reduced, leaving in its place flat marsh land, which was soon reclaimed for pasture and cultivation in the areas of older sedimentation. A well-formed finger delta marks the advancing infill which would have shown greater progress had Loch Vennachar not been deepened by a dam, raised to supply water to the river mills below Callander which were left short of power when Loch Katrine was impounded.

It will be seen from the foregoing account that Glen Finglas and its river are more important to the economy of the region than their appearance on a map would lead one to believe. It is the only considerable valley

that breaks across the northern rampart of hills. At its mouth, on a low shoulder overlooking the alluvial flats and craggy hillocks of the Black Water flood-plain, stands Brig o' Turk on one of the few sites possible for a settlement of this size. Had the history of the drainage system been such that the Turk drained Loch Voil which lies across the watershed from Glen Finglas, then Brig o' Turk might have played the rôle of modern Callander. In fact a 1400 foot col separates the two valleys, which rules it out for modern communications, but in the past it was regularly used by foot passengers and pack trains. It was also much used by smugglers of illicit whisky in order to avoid the customs officials guarding the parallel and easier route along Loch Lubnaig. Moreover, the Glen Finglas track leads to Aberfoyle and thence to Glasgow, but it first passes through Brig o' Turk which commands the only land bridge possible between the two lochs. The old bridge crossing the Black Water at this point is now little used ; it stands as a memorial to the time when transverse land routes across the water and swamp-filled valley were few and precious.

Generally passage along the highland glens is easier or made less arduous where long lochs give facilities for water carriage. But in the Brig o' Turk area between Loch Vennachar and the " inland sea " of Katrine land porterage was the simplest mode of carriage, hence the old coach road from Callander, the line of which may still be traced on the summits of low ridges or along shelves found on the valley flank where it avoided the swamps and rocky crags that impede the way along the valley floor. Modern engineering makes light of these difficulties, and the tourist road leading to the Trossachs hugs the loch shores most of the way, and crosses the River Turk by a fine bridge where formerly there was a difficult ford. Now, as yesterday, the main road ends at Loch Katrine where the traveller faces the vista of Strath Gartney, which illustrates the remoteness of the highlands from the mainsprings of lowland life.

By contrast, the people of Brig o' Turk are constantly in touch with the outer lowland world. Indeed, like Callander, it is a highland edge settlement without the advantages of that town and without the stimulus of deliberate burgh creation which formed the initial basis of Callander's growth. But Brig o' Turk does control crossroads and commands some of the best arable land available in this poor district ; for these reasons alone Brig o' Turk has long figured as an important rural settlement or township in the Scottish sense. By the grouping of the present-day houses into separate nuclei, each group commanding certain arable land, one would deduce that there was at one time an aggregate of " ferm touns " or conjoint tenants working the land communally. Two miles up the Turk, beyond the gorge where the alluvial fans filling the old lake bed provided arable land, a second small community existed called Duart. There, there lived and worked as late as 1763 eight farmers—all by the name of Stewart and all kinsmen—who were tenants and possessors of the lands of Glen Finglas and Wester Brig o' Turk. That their farming was successful is shown by the memorandum, of the same year, sent to the Earl of Moray and stating that they had made improvements upon their farms, that they were willing to make further improvements and to pay additional rent on condition of obtaining a lease. The rent then appears to have been settled at £210, a considerable sum for that period.[1] Where once were eight farmers with

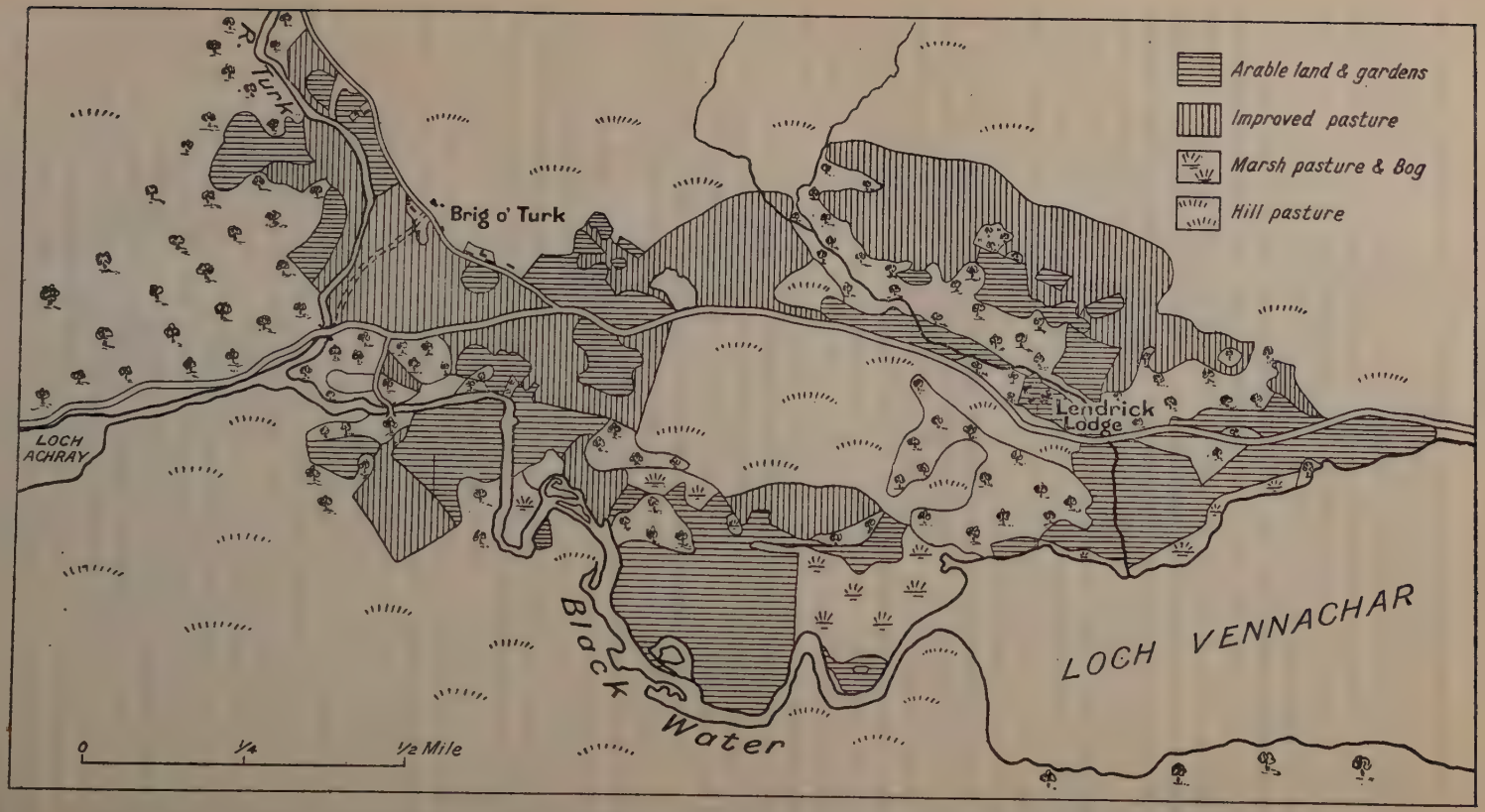

Fig. 1. Brig o' Turk. Land utilisation in 1850. Based upon the Six Inch Ordnance Survey Map of Perthshire, Sheet CXXIII N.W., with the sanction of the Controller of H.M. Stationery Office.

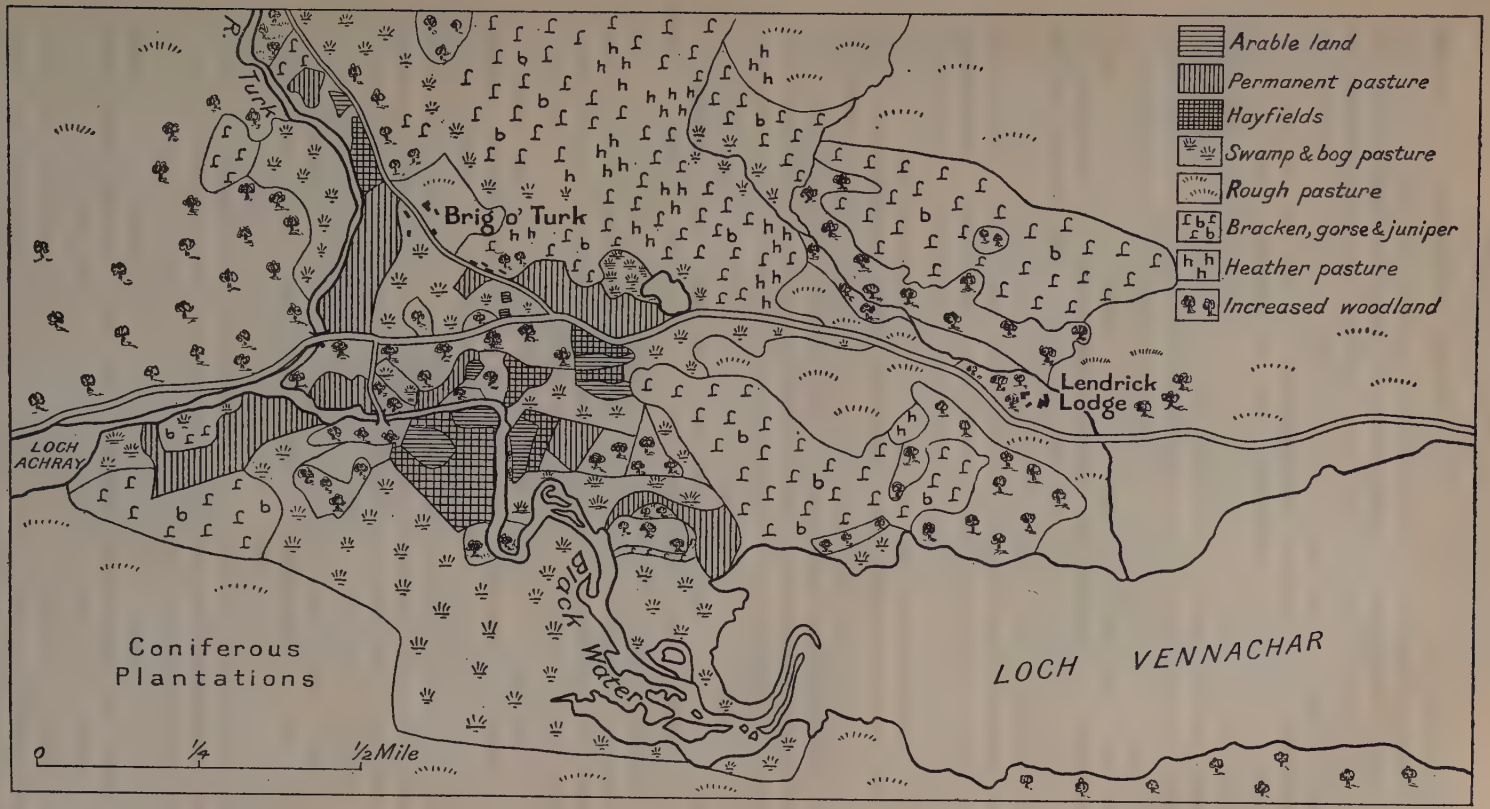

Fig. 2. Brig o' Turk. Land utilisation in 1945. Based upon the Six Inch Ordnance Survey Map of Perthshire, Sheet CXXIII N.W., with the sanction of the Controller of H.M. Stationery Office.

subsidiary cottars, now only four shepherds and their families find support from the land. To-day it is one of the most progressive hill sheep farms to be found in Perthshire. So important it is that the agricultural press allotted two pages of special photographs of the farm and stock in two numbers.[2] Glen Finglas farm to-day extends to 11,000 acres which cover the greater part of the three headstreams of the Turk and reaches downstream (including land on both sides of the river) as far as the village itself. This land carries about three thousand sheep, a hundred head of breeding cattle, and a small stud of highland ponies—besides, one might add, a number of deer (six hundred were killed on Glen Finglas farm in the great drive of 1940). This head of stock is very adequate when one considers the pasture land. The valley floors are often swampy and reed covered save for the 35 acres of good land near the farm-house itself, and downstream the valley shelves above the gorge are heavily wooded. On the hill summits there are deep hags, while the hill slopes are steep and craggy with land slips in certain areas of glacial deposit. Indeed, an annual loss of three hundred sheep is expected through accident and disease. Besides these disadvantages the land is heavily infested with bracken, which is being kept down by contracting Irish labour (fourteen men) between spring and autumn who in that period are employed continuously cutting the bracken areas. The farm is progressive and, as far as one can ascertain, economically successful. It is progressive in introducing cattle in the attempt to improve the texture of the hill grazing, and so to circumvent the selective grazing of sheep. Since snow remains far into the spring, hardiness of the outlying stock and adequate winter pasture are necessities to successful stock breeding. A sturdy breed of first and second Highland-Shorthorn crosses is being developed. The calves, born out of doors in March, are sold in October, when about seventy-five are marketed.[2] Throughout the winter the cows are kept on low ground which has been kept free from grazing for that purpose. The sheep also are brought down from the hills and, like the cattle, feed is supplemented by fodder crops grown on the farm.

The Glen Finglas boundary fence which runs east from Brig o' Turk to the summit of Ben Ledi separates the farm from Lendrick (Lanrick) estate. Though the latter has less difficult slopes and a southern aspect overlooking Loch Vennachar and the Black Water, yet the land is derelict and useless because of the bracken growing abundantly on the lower ground, and thence to 1000 feet. In the depressions and on the hill shelves, reed beds and sphagnum moss further reduce the value of the grazing, but on rocky slopes where the soil is thin heather still maintains itself. It is only in the vicinity of the hamlet, on old croft land, that the grazing is better, and this is utilised by the Glen Finglas cattle during the summer.

Lendrick is a shooting estate, yet even that function is not being fulfilled. In the hard winter of 1940 the grouse disappeared, as elsewhere in the country. In the same year the deer were all but eliminated by Government order. It will take many years for the game to be brought back to pre-war level. And year by year, with lack of grazing, the bracken is extending over greater areas. (See Figs. 1, 2.) Such land is as unsuitable for game as it is for commercial farming ; it is therefore doubtful whether the shooting will ever again be as profitable as formerly. It is debatable whether the land can even be profitably forested, though this is the only possible solution,

for the land cannot easily be retrieved for pasture. The expense of afforestation, in which bracken cutting will loom largely, will be prohibitive for the landowner, and therefore it is probable that this land will ultimately pass into the hands of the Forestry Commission. In all fairness one must say that the bracken menace here is no worse than on much of the land on the way to Callander. Once neglected, the bracken, in a climate of heavy rainfall such as this, spreads rapidly not only by creeping rhizomes but by spore dissemination as well.[3]

That Lendrick land was once more carefully farmed is evidenced by the ruins of three substantial farm steadings and in miles of ruined and overgrown dykes. The cottages in Brig o' Turk which were once attached to Lendrick land, like those attached to Glen Finglas, look upon their croft land as only a subsidiary consideration. Of the nineteen families resident in the village only five supplement their income from the land, and these five all belong to an older generation who were in their youth more closely concerned with farming. The common croft field (still held in severalty) continues to be cultivated in strips, but the crops are miserably poor. Save for this field and for the fields of another crofter who as a small-holder comes into a different category, no other land comes under the plough. Some of the old croft land is kept for hay, and year after year the natural hay crop is taken without the ground being in any way compensated. Occasional bull calves, surplus milk, and eggs in season are the only saleable products. In a comparable peasant community on the Continent the blaeberry and cranberry crop on the hills would be prized and carefully picked ; here no real effort is made to benefit from the natural harvest.

Farming of this order would anywhere else spell poverty ; here, on the contrary, the prosperity of the people is clearly noticeable in their trim cottages and substantial way of living. To these people the summer visitor is the fairy godmother to whose whims they must pander or else suffer a lower standard of living. But the tourist season is short, and therefore the men folk and young people must seek other means for breadwinning in the winter months. The two important employers in the district are the Glasgow Corporation Waterworks and the Forestry Commission.

The Forestry Commission land lies over the river from Brig o' Turk and extends from Ben Venue to Loch Vennachar and across the watershed into the Vale of Menteith. The planting in this area is still unfinished, the complete afforestation being planned so that the last section will be planted when the first is ready for cutting, a 25-year plan assuring constant employment. Land, as yet unplanted, is being kept under sheep, and there are now some 910 ewes left on 4000 acres of land. On land previously cultivated, forage crops are grown to supplement the winter feeding of the stock and provide fodder for the working horses. Besides the shepherds and farmer, five other young men in the village find employment in forestry.[4]

The Glasgow waterworks at Loch Katrine employ some of the older men of the village, usually those with some skill or trade. The employment the Corporation offers has a wider range than that of the Forestry Commission : control of the sluices, upkeep of the roads and embankments, care and development of the plantations and woodlands, shepherding, farm work, and crews to man the steamer and accessory craft on the Loch. In fact any such work that involves the Trossachs end of Katrine draws daily

labour from Brig o' Turk. There is one other source of employment for the young people of the village : the two large hotels of the district. But the greater part of the hotel staff is imported for the season, so that there are few openings for constant employment. At most these hotels offer an interim occupation until the young people are old enough to leave the district for better prospects in the lowland towns.

It is apparent that Brig o' Turk is more fortunate in the possibilities of employment than many other highland townships. Yet the number gainfully employed is much smaller than it was a century ago, as the disused houses and crofts painfully bear witness. Indeed only one cottage has been added to the village in the last fifty years. No land is feued to outsiders or to speculative builders, else the centre would have become popular as a place of residence. But legitimate building for an expanding tenantry is favoured. Since this has not taken place, it seems that the population is in a state of equilibrium as regards numbers and opportunities for employment. It is, however, an ageing population—the large school where once there were 50 pupils now has scarcely a score, and of these many come from Loch Katrine side.

Much could be done to stimulate employment and encourage a younger and more active community. The Forestry Commission offers the greatest promise. Their plantations in this area will constitute one of the most important forests in the kingdom. It is estimated that 100 acres of forest give employment to one man ; this must be measured against 2000 acres per man on an average sheep farm. In the process of thinning the woods four men are needed per 100 acres. It is therefore only necessary to import labour at the time of planting and at the cutting. What is more important is that the busy season in forestry is between October and April—which in other rural pursuits is the slack period. The steady income from the Government alleviates insecurity and poverty, and the possession of a croft means a balanced diet and a sustaining interest to the man and his family.[4]

Further, in a forest area of this size forest industries are a practical consideration. Small local industries, as barrel-making, basket-making, and articles made from wood, are all assured of success if the necessary craftmanship can be established ; with vision and direction this should not be an insuperable difficulty. Furthermore the gorge upstream from Brig o' Turk offers excellent possibilities for hydro-electricity on a small scale —though it must be borne in mind that Glasgow has already acquired the right of Glen Finglas old lake bed as a possible supplementary reservoir.

Secondly, all the resources of the tourist industry have not been investigated. There is room for accommodation for the family of moderate means ; the youth hostel at Brig o' Turk already caters for the young and hardy. If visitors are encouraged in this way then there is opportunity for old croft land to be brought back into productivity by making the better lands into market gardens and the old pasture lands into better grazing for enlarged dairy herds.

It would seem desirable that the Forestry Commission, the Glasgow Corporation (Waterworks), the Scottish Tourist Association, and the private landowners co-operate in the furtherance of so laudable a scheme. Need it be emphasised that such a scheme would not necessarily destroy the great beauty of this historic region. Necessity of war has already robbed it

of much of its charm, for instance, acres of natural woodland have been cut. New houses and workshops look intrusive and alien in the landscape, but later they take on the patina of their surroundings and add to the beauty of the cultural scene ; and the atmosphere created by a happy, active and contented rural community is part and parcel of the attraction of an area to the visitor and tourist.

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COIRE BHREACAIN

By W. Allan Fisher, A.R.T.C.

Interest in this famous gulf on the west coast of Scotland has been revived by the recent filming of " I know where I'm going," parts of which were ' shot ' in the vicinity of the gulf itself. Of the various renderings of the name Coire Bhreacain,[1] such as Corebreken (Mercator, 1595), Koribriken (Blaeu, 1657), and a score of other variants, or corruptions, Corryvreckan is at the present day the one most commonly known. Originally referring to the whirlpool—now named Slog-na-mara—between Rathlin Island and the coast of Antrim, where Brecan (grandson of Niall of the Nine Hostages) and his fifty curachs were supposed to have been lost, the name Coire Bhreacain (Brecan's Cauldron) was applied to the strait between Jura and Scarba probably by the monks of Iona.

This gulf is about six cables wide at its narrowest part just inside the eastern entrance, and reaches a maximum depth of 120 fathoms. The eastern entrance is approximately $6\frac{1}{4}$ nautical miles from Crinan, at the western end of the Crinan Canal, and the passage forms a very tempting gap to the west through the chain of islands off the coast of Nether Lorne.

From early times this place has had an evil reputation, and small vessels, especially under sail alone, are warned of its dangers and advised to keep clear of it except in very settled weather and at slack water. Perhaps the earliest references are to be found in the " Life of St. Columba " by Adamnan, Abbot of Iona (A.D. 679), although the strait mentioned by him has been said to refer to Slog-na-mara, and not to that at Scarba. Adamnan calls it Charybdis Brecani, and also refers to a stormy passage experienced, which is interesting even if it really refers to Rathlin, and reads as follows : " On another day Saint Columba, while engaged in his mother-church, with a half suppressed smile suddenly exclaimed, ' Columbanus the son of Beognai, who has this moment embarked to sail over here, is in danger in the rolling tides of Brecan's whirlpool ; he is sitting on the prow, raising both his hands to heaven ; he is blessing that angry and dangerous sea ; the Lord frights him in this manner, not that his ship should suffer shipwreck in the

Fig. 1. Flood streams from the Sound of Jura to the Firth of Lorne and adjacent waters.

storm ; but rather to excite him to pray more fervently, that by God's favour he should escape the danger of his voyage to our Island '." No doubt many more modern mariners have been " excited to pray fervently " when battling with the overfalls and whirlpools in this passage between those isles.

The traditional legend, associated with the Prince of Lochlann, has been given prominence in the film story. It is mentioned in a footnote in " The New Statistical Account of Scotland," but is excellently told by Seton Gordon in his " Highways and Byways in the West Highlands," and need not be recounted here.

More recent writers on the western isles describe the gulf in the highly coloured language of their times. Martin Martin [2] says : " It yields an impetuous Current, not to be matched any where about the Isle of Britain. The Sea begins to boil and ferment with the Tide of Flood, and resembles the boiling of a Pot ; and then increases gradually, until it appears in many Whirlpools, which form themselves in sort of Pyramids, and immediately after spout up as high as the Mast of a little Vessel, and at the same time make a loud Report. . . . This boiling of the Sea is not above a Pistol-shot distant from the Coast of Scarba Isle, where the white Waves meet and spout up : they call it the Kaillach [Cailleach], i.e. an old hag ; and they say that when she puts on her Kerchief, i.e. the white Waves, it is then reckon'd fatal to approach her." (See illustrations.)

MacCulloch [3] writes : " Corryvreckan is an enormous whirlpool which swallows up all ships that come within a mile of it. . . . It is impossible to be engaged in this wild place without anxiety. With every precaution, danger is always impending. The error of a few minutes might have been the price of as many lives, and you may well imagine I did not linger them away on rocks far more dangerous than those of the Sirens."

When considering some of the reasons for this violent disturbance in the gulf, a study of the topographical features of this region will reveal the effect on the direction and rate of the tidal streams. The main stream of flood approaches from the Atlantic and is divided when it reaches the coast of Islay : one branch sets north-eastward direct into the Firth of Lorne while the other branch again divides and sets partly into the Sound of Jura and partly round the Mull of Kintyre into the Firth of Clyde. Islay might be visualised as the termination of a broken peninsula running S.S.W. from Lorne and forming the western boundary of the Sound of Jura, the other boundary being the peninsula of Kintyre. This western boundary has several gaps which lead from the Sound of Jura into the Firth of Lorne and adjacent waters, the principal ones being the Sound of Islay between Islay and Jura, Coire Bhreacain between Jura and Scarba, lesser ones between Scarba and Lunga, Lunga and Fullah, and finally the northern exit between those isles and Luing, i.e. Scarba Sound. (See Fig. 1.)

According to the *West Coast of Scotland Pilot*,[4] the time of high water on the north-west coasts of Islay, Jura and Scarba coincides roughly with that of high water on the south-east coasts of these islands, but at spring tides there is a difference in height of about four feet, the tide rising higher in the open water to the north-west of the islands than in the Sound of Jura. This causes the tidal stream to run south-eastward in these channels at great velocity from about an hour and a half before it is high water in them until about the same interval before low water. The difference in height

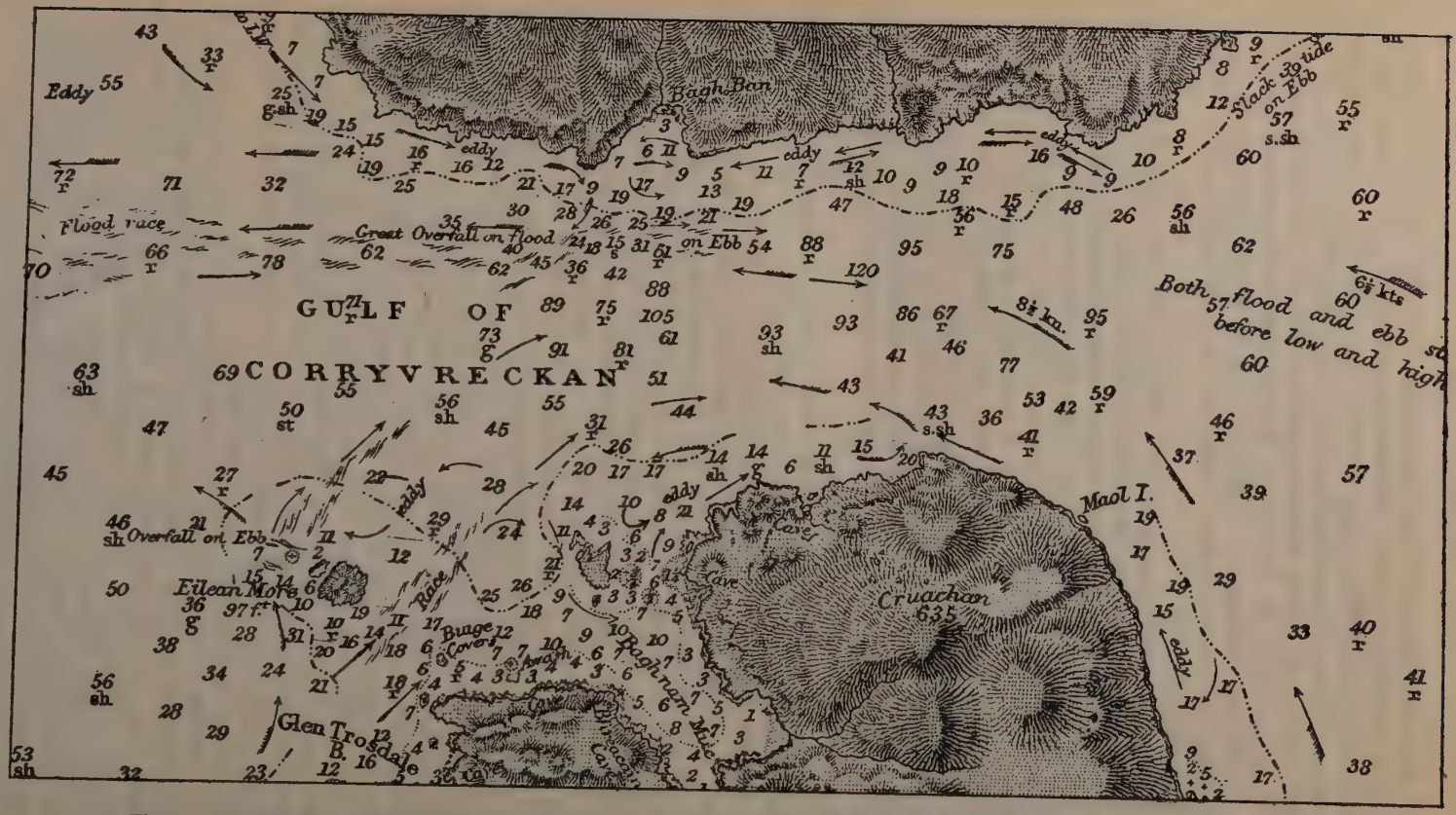
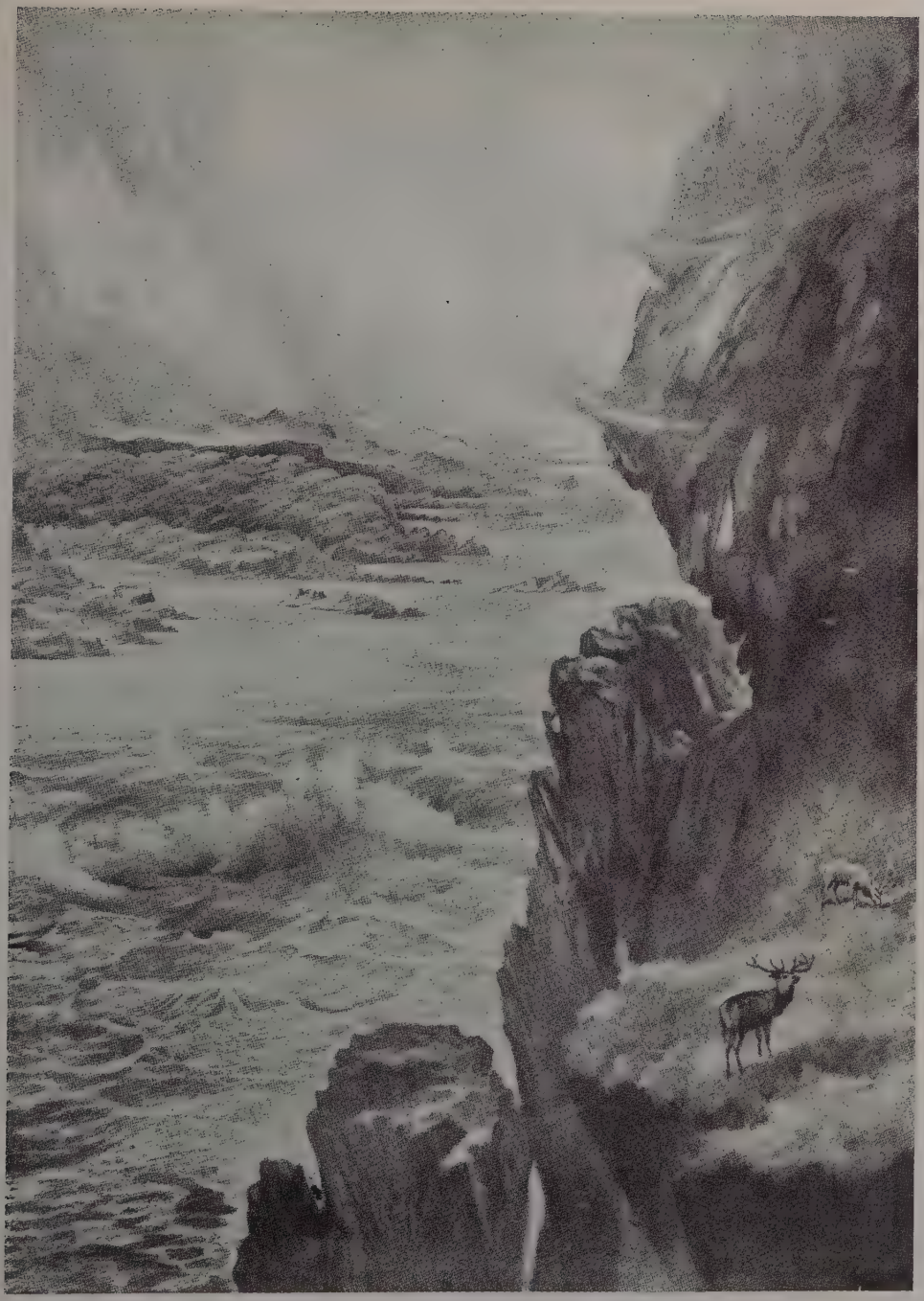
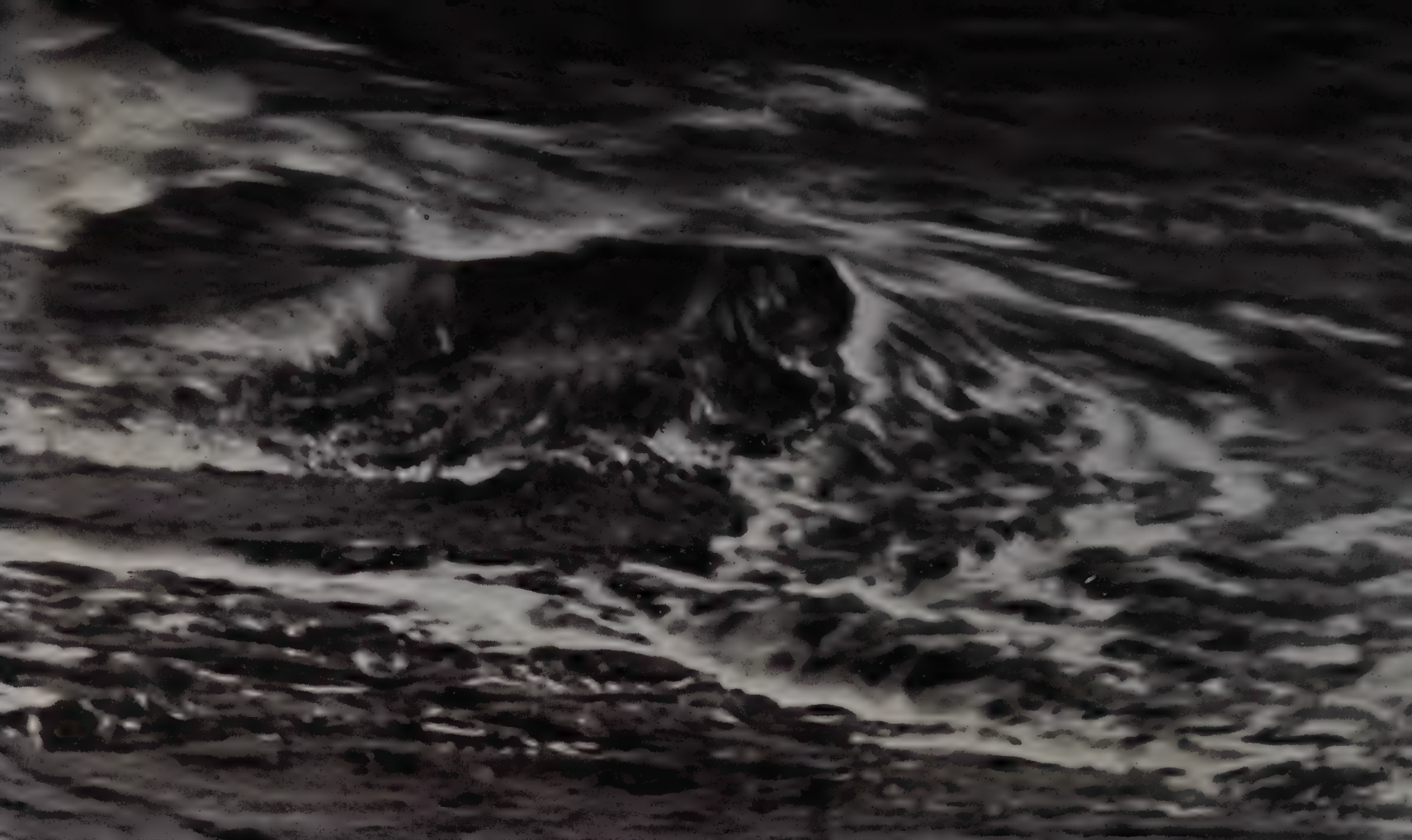
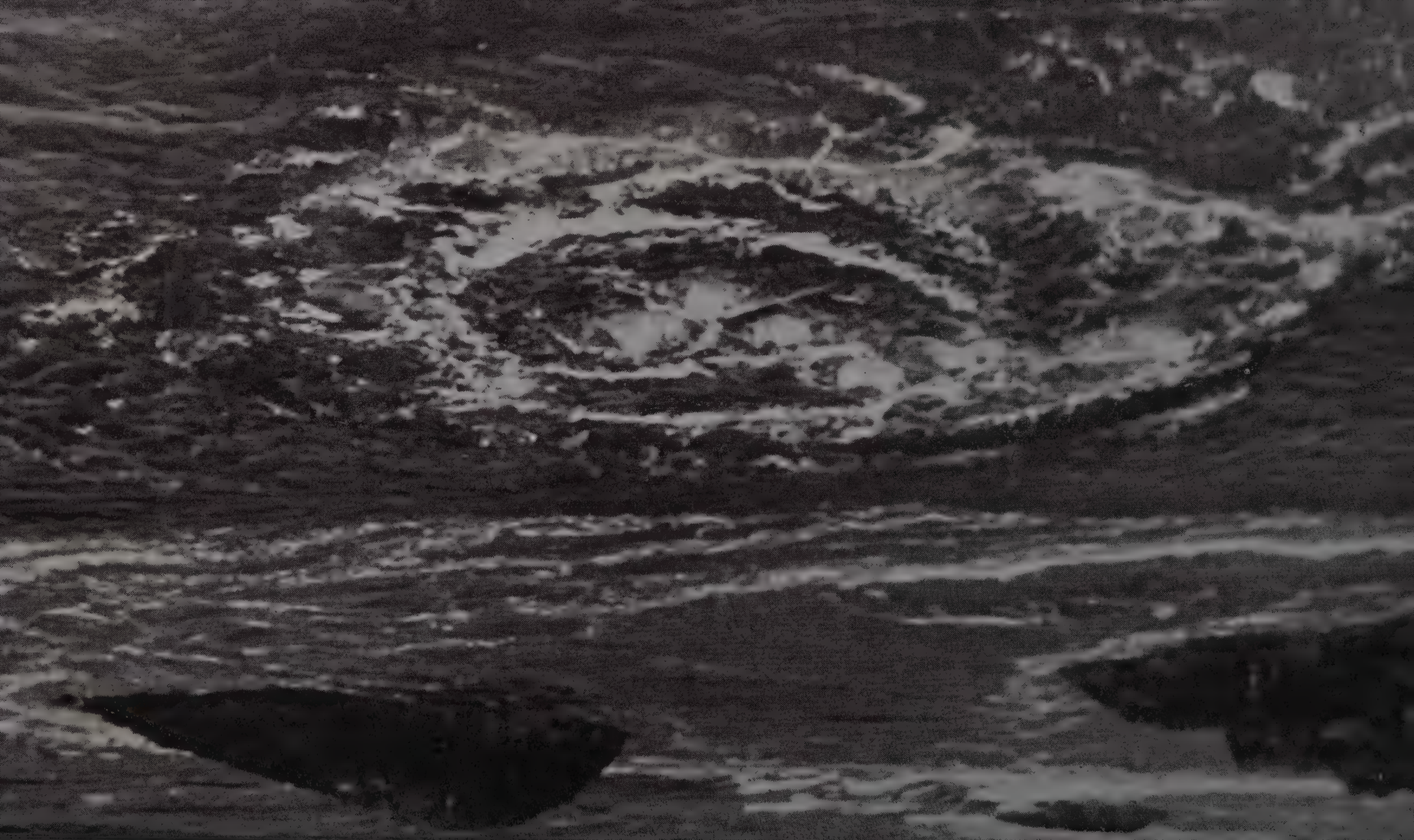


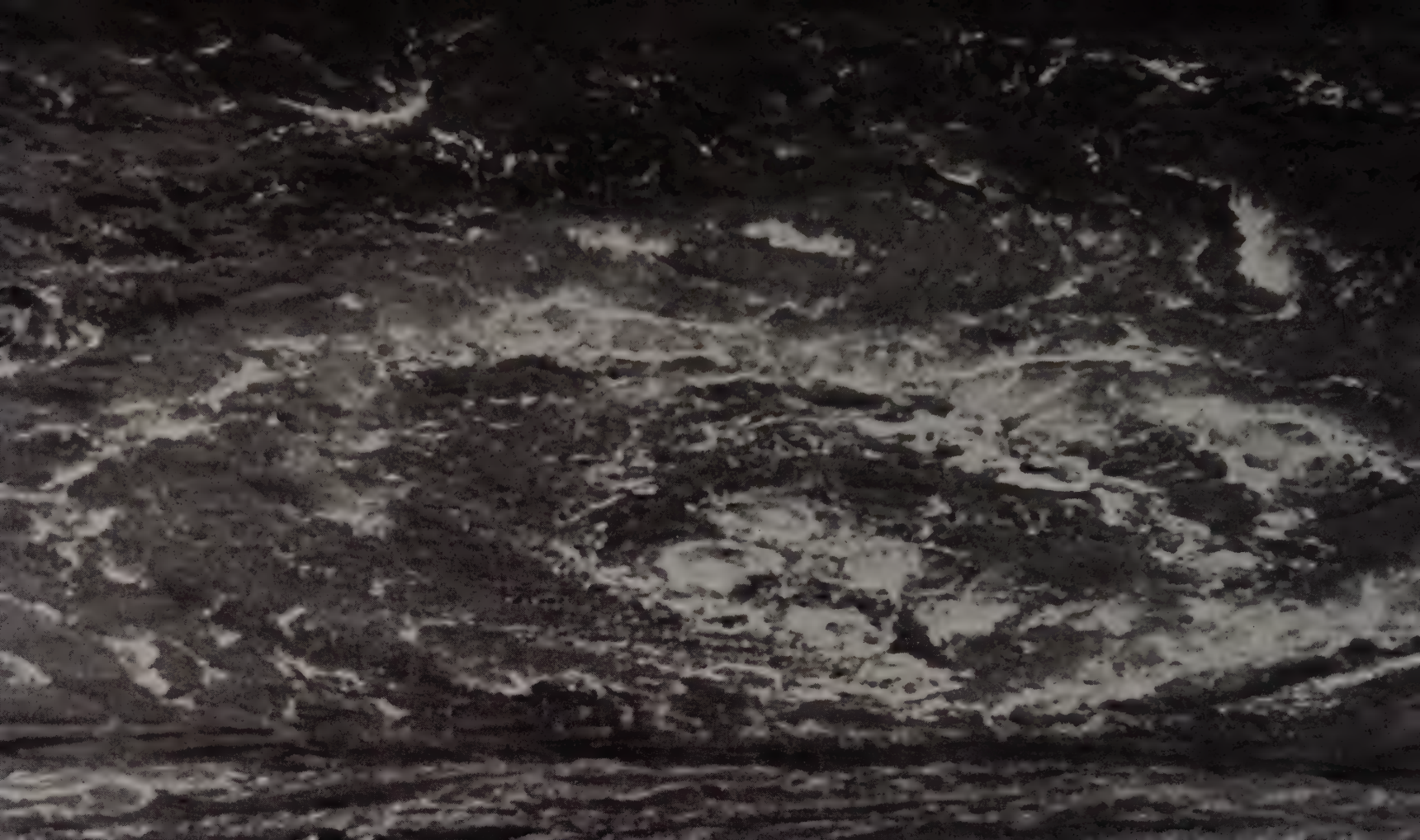
Fig. 2. The Gulf of Coire Bhreacain (Corryvreckan). Reproduced from British Admiralty Chart No. 2326 with the permission of the Controller of H.M. Stationery Office and of the Hydrographer of the Navy.



COIRE BHREACAIN







is reversed at low water, the water on the north-west coasts of the islands being lower than that in the Sound of Jura, causing a strong flood stream from about one and a half hours before low water setting seawards through the various channels. These streams run through the gaps in the line of islands at a rate of from 6 to 8 knots at springs, causing eddies and whirls wherever the passage is obstructed in width or depth.

So far as Coire Bhreacain is concerned, the flood stream in the Sound of Jura is broken up by a lesser ridge extending from Craignish Point, ending in Ruadh Rock ledge, and broken by several gaps. A branch of the stream pours through the Dorus Mór, the first gap between Craignish Point and this ridge, and sets direct for the gulf. The shape of the passage between Jura and Scarba converges to a throat, 6 cables wide, and then diverges to the westward, this shape being ideal for the generation and ejection of a powerful stream of water through the gulf when the necessary static head of water is available. The depths vary considerably in the gulf itself, 120, 105, and 50 fathoms being found in places, while off a small bay, Bàgh Bàn, on the Scarba shore, a pinnacle rises to within 15 fathoms of the surface at low water with 25 to 42 fathoms close around it. The flood stream rushes through at 8½ knots at spring tides, causing violent overfalls and whirlpools especially on the Scarba side but less violent on the Jura shore. When on the flood, eddies and counter streams set back on each side of the main stream and cause great turbulence. The race upon the flood, as the chart describes it, extends beyond the western outlet from the gulf for a distance of about five miles towards the island of Colonsay, but its velocity gradually diminishes. In strong westerly winds opposed to this stream the seas are dangerous to small craft and within the gulf the violence is such that the whole channel is a mass of broken water. On the Jura side a small islet, Eilean Mór, obstructs the free passage and again we have eddies and whirls. (See Fig. 2.)

The ebb, or east-going stream, does not run with such rapidity as the flood and is less violent, emerging as it does into comparatively quiet waters behind the natural breakwater of the islands. It is directed towards the Dorus Mór and the other channels in the ridge extending from Craignish Point.

The *Pilot* [4] informs us that it is seldom that the water is slack in the gulf, although during fine weather the surface may be quiet for about one hour at neaps but only a quarter of an hour at springs, between the change in the direction of the flood and ebb.

Lesser streams pour into the Firth of Lorne through Scarba Sound and Cuan Sound and also to the north of Scarba between that island and its neighbour, Lunga, through Bealach a Chumhainn (Choin) Ghlais.

The West Coast *Pilot* goes on to warn vessels regarding navigation of the gulf thus : " The navigation of the Gulf of Corryvreckan is at times most hazardous, and no stranger would under any circumstances be justified in attempting it. When the streams are slack and the waters quiet in fine weather the gulf might perhaps be navigated with safety. If, however, a sailing vessel should be near the eastern entrance to the gulf, during the west-going stream at springs, she will be carried through. Then secure the hatches and endeavour to pass through the middle of the gulf, and probably the stream will take the vessel between the most violent breakers,

which lie upon each side. If the vessel should be taken towards the coast of Jura, it is advisable to keep near it, so that the stream may carry her past the small islet off the north-eastern entrance point of Bàgh nam Muc, and if the wind be favourable she may, with the assistance of the eddy, be able to shoot into that small bay, where the ground is clean, and shelter good." (See Fig. 2.)

It is interesting to note that the possibility of navigation during slack water is referred to in the *Scots Rutter* by Alexander Lindesay revised by Nicolas de Nicolai (before 1566) for Charles of Guise, cardinal of Lorraine. " Entre Scarba et Dura, ya la plus dangereuse marée qui soit cognue en Europe, à cause des diversitez des marées, lesquels courant entre la Mulle de Kynteir et Illa, passant parmi l'estroit canal, et en passant, court avecques si grande violence sus la coste de Scarba, quelle est rejette à la coste de Dura, avecques bruit si espouvantable quelle fait à son retour un profond et bruyant goulfre, qui garde et empesche les navires d'y entrer, et n'ya aultre refuge sinon à Dieu et à la mort : neantmoins, le tems plus convenable pour passer ledit danger est quand la marée est plaine, ou quand elle est du tout basse. Ce passage est vulgairement appellé Correbreiken." [5]

Modern writers also refer to the passage through the gulf with awe but in more prosaic terms. Captain J. R. Harvey, R.N. (Retd.), writes : [6] " Whatever you do keep away from the eastern approach to the Gulf of Corryvreckan, because the flood or north-going stream runs direct into the gulf . . ., and it is no place for a small yacht. The gulf itself in a westerly gale is a fearsome place. I remember my father telling me of a West Highland steamer, laden with a deck cargo of cattle, which in a westerly gale was drawn into the gulf from the westward. The ship took a big list owing to the cargo shifting, making it necessary to throw the cattle overboard, and she only just managed to steam out before she was actually in the gulf." He also says: " A fisherman of Islay, who knows the coast well and has been fishing in amongst its islands all his life, told me that the gulf was ' not bad,' but he had to allow that near spring tides and always with a westerly wind, even a moderate westerly wind, against a flood stream, it was impassable."

The passage through the gulf considerably reduces the distance from Crinan to Colonsay or to Iona in comparison with that northwards via Scarba sound and past the Garvelloch Isles (Isles of the Sea). The distance to Colonsay (Kiloran of the film) is reduced from $32\frac{1}{2}$ to $23\frac{1}{2}$ miles, while that to Iona is, to a lesser extent, reduced from 39 to $34\frac{1}{2}$ miles. Coire Bhreacain is frequently used by steam lighters or ' puffers ' when making the passage from Crinan to Colonsay, Iona, Tiree, and the west coast of Mull, but only at or near slack water and in fine weather. When making the return passage from the isles, however, these hardy little coasters frequently pass through the gulf on the ebb and thence across to Crinan via the Dorus Mór. Lobster fishermen lay their pots along the Jura shores of the gulf and make use of local knowledge of the eddies. It is of interest to record that in July 1946 a yacht, dismasted off Skerryvore and reaching Colonsay under jury rig, was towed through the gulf by the lifeboat *against* the flood. The lifeboatmen used the passage between Eilean Mór and Jura and took advantage of the counter currents along the Jura shore.

The most modern account of passages in sailing yachts through the Gulf of Corryvreckan are those of Iain Rutherford, an intrepid yachtsman

who has cruised extensively in converted racing yachts. His descriptions of a westward and also an eastward passage are interesting.[7] In 1935 he sailed to St. Kilda and back in a converted 6-metre racing yacht, *Suilven*, and writes: " Leaving Crinan, we had a commanding breeze, and as we reached out to the west under trysail we felt ready for anything. The tide was slack for Corryvreckan ; the sun was shining, and—well, we simply couldn't resist the dreaded gap between Jura and Scarba, so, instead of freeing sheets after passing through the Dorus, we held on to the west. Keeping close to the Jura shore, we raced through the passage and were soon rearing over the larger Atlantic seas ; but it was wet and uncomfortable, and we decided to make our way to Barra by the Sound of Mull and thus obtain as much smooth water as possible."

In 1937 he passed through the gulf in *Pleiades of Rhu*, an 8-metre, on the way back from the west coast of Mull via the Sound of Iona, across to Corryvreckan and on to Crinan. He says: " . . . the wind died when still some miles from the dreaded gulf of Corryvreckan. . . . Owing to the swell it was impossible to lash the dinghy alongside (to tow the yacht using the outboard motor on the dinghy) so I towed *Pleiades* from the dinghy, feeling rather insignificant as I buzzed along in the little dinghy over the long swell. Entering Corryvreckan with the east-going stream, I suddenly found myself confronted by a line of ugly looking overfalls, and decided that discretion was the better part of valour. I just had time to cast off the tow rope and get aboard *Pleiades* before we were in the thick of the breaking water. We were caught in the grip of the tide with no control of our movement, and to our horror we found ourselves being carried towards the Scarba shore at a rate of knots. Just when things looked hopeless a breeze appeared from nowhere and we regained sufficient command to sail into the centre of the stream. Corryvreckan with its $8\frac{1}{2}$ knot tide, its overfalls and whirlpools is certainly not a place to be trifled with. I have often wondered what would have happened to us if the providential breeze had not arrived ; it is said that a tide always carries a ship clear of the shore. With the wind and tide we made grand speed and were soon anchoring off Crinan. . . ."

The accompanying illustrations [8, 9] give a vivid idea of the whirlpool and overfalls without the uncomfortable feelings of awe which one must have in making the passage in a small vessel. The " great race upon the flood " indicated on the Admiralty chart,[10] extends for five miles to the westward of the gulf and must at times raise a very dangerous sea.

The roar of Corryvreckan can be heard from Craignish Point three to four miles distant, and even, occasionally, from Crinan.

In conclusion, a quotation from the Old Statistical Account may not be altogether out of place, summing up, as it does, the evil reputation of this wild place. " Between Jura and Scarba the space is about one mile over, in this narrow strait. Three currents formed by the islands and mainland meet a fourth, which sets in from the ocean. The conflux is dreadful and spurns all descriptions. Even the genius of Milton could not paint the horror of the scene. At the distance of 12 miles a most dreadful noise, as if all the infernal powers had been let loose, is heard. By the conflict of these inanimate heroes, who will not yield, though fighting twice a day since the foundation of the world, an eddy is formed, which would swallow up the largest ship of the line. But at full tide these combatants take a

little rest, and when they are asleep the smallest bark may pass with impunity."

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[2] Martin, M. "A Description of the Western Islands of Scotland." London (2nd ed.), 1716.

[3] Macculloch, J. "The Highlands and Western Isles of Scotland." Vol. IV. London, 1824.

[4] Hydrographic Department, Admiralty. West Coast of Scotland Pilot.

[5] Cited in Taylor, E. G. R. "Tudor Geography, 1485-1583."

[6] Harvey, J. R. "Sailing Orders." London, 1935.

[7] Rutherford, I. "At the Tiller." Glasgow and London, 1945.

[8] Illustration by A. Scott Rankin in "Nether Lorn," by Patrick H. Gillies (1909), reproduced by kind permission of the publishers, Messrs. Virtue and Co. Ltd.

[9] Photographs by courtesy of The Archers Film Productions Ltd. "I know where I'm going!" written, produced and directed by Michael Powell and Emeric Pressburger.

[10] No. 2326. Loch Killisport to Cuan Sound including the Sound of Jura. 1945.

ANENT A SCOTS EXPLORER

BIOGRAPHICAL SKETCH OF SIR JAMES LAMONT OF KNOCKDOW

By Augusta Lamont, M.A., B.Sc.

James Lamont was the only son of Alexander Lamont of Knockdow, Argyllshire, and was born in Edinburgh on 26th April 1828. Educated at the Edinburgh Academy and at Rugby, he started his career at the age of eighteen with a Commission as Ensign in the 91st Argyllshire Highlanders, but served in the army only from 1846 to 1848. From a boy he was devoted to sport with gun and rod; and, falling heir in 1850 to his uncle, John Lamont of Cedar Grove and the River Estate, Trinidad, and of Benmore in Cowal, he was enabled to start on a series of travels for sport and adventure.

A collection of his sporting trophies at Knockdow attests the extent of his big game hunting in South Africa in the early 'fifties, but during that decade and the next he also travelled widely in other parts of the world, including the West Indies, Venezuela, the United States of America, Labrador, and the Mediterranean. Much of his voyaging was accomplished in his yacht, the *Ginevra*, a schooner of 145 tons, and in her he also made his first two voyages to the Arctic Seas in 1858 and 1859, an account of which is given in his book "Seasons with the Sea-Horses." [1] His subsequent three voyages, to Novaya Zemlya and Spitsbergen in 1869, to Novaya Zemlya and the Kara Sea in 1870, and again to Spitsbergen in 1871, were undertaken in the steam-yacht *Diana* (251 tons), which he had built for the purpose on the Clyde. A second book, "Yachting in the Arctic Seas," [2] records the events and scientific observations of these later exploring trips.

In this career, devoted so largely to sport and travel, time was also found for political interests and local affairs. In 1859, and again in 1865, he contested unsuccessfully the County of Bute in the Liberal interest, but

was returned for that constituency in 1865 and sat in Parliament for three years. He was a D.L. for the county of Bute and a J.P. for Argyllshire, and from 1896 until his death he was an elder of the Church of Scotland in his home parish of Inverchaolain. He was created a Baronet in 1910.

James Lamont married in 1868 Adelaide Eliza, elder surviving daughter of Sir George William Denys, Bt., of Draycott Hall, Yorkshire, and had issue two sons and one daughter. The elder son, Norman, succeeded him in the Baronetcy and estates; the second, Alexander, Lieutenant in the Gordon Highlanders, was killed at Dargai, India, in 1897.

It is matter for regret that one who had such varied and interesting experiences kept no written record of his doings and observations other than what is contained in the two books above-named dealing with his Arctic voyages. Writing was distasteful to him, and he seldom put pen to paper unless roused by some controversial topic which impelled him to enter the lists in support often of the less popular point of view. Among these topics stand out the American Civil War of 1861-1865, and the South African War of 1899-1902. A lecture which he gave on "The Civil War in America" to the Rothesay Mechanics Institute in 1864 was printed in pamphlet form,[3] and is a sample of trenchant and vigorous style and well-balanced judgment based on personal experience. In the case of the South African War his convictions were equally strong and similarly based on previous personal knowledge of the country in question. His views in this case were expressed in a letter to the *Glasgow Herald* dated from Knockdow September 2nd, 1899, and incidentally experiences of his own and of his fellow-sportsmen among the Boers and the South African natives are quoted, and give an indication of some thrilling encounters in the Dark Continent of nearly fifty years before.

During the last year, however, before his death, when, although almost bed-ridden, his vivid memory and keen intellect were undimmed by the years, he wrote a series of recollections and anecdotes of great interest to the naturalist and the traveller as well as to the sportsman. These were published under the title of "Sporting Reminiscences by '84'" in the *Scottish Field*, and appeared in seven successive numbers running from October 1912 to April 1913.

Sir James Lamont died on July 29th, 1913, and lies buried in the private burial ground at Knockdow.

[1] Lamont, James. "Seasons with the Sea-Horses." London: Hurst and Blacket, 1861.

[2] —— "Yachting in the Arctic Seas." London: Chatto and Windus, 1876.

[3] —— "The Civil War in America." Glasgow: W. Anderson Eadie, 1864.

[A few place-names in Spitsbergen perpetuate Sir James Lamont's memory. Professor R. N. Rudmose-Brown has kindly supplied some relevant particulars from Svalbard Place-Names [cf. *S.G.M.*, 1944, 60(*3*)]. *Lamontöya* (Lamont Island) in *Ginevraboten* (Ginevra Bay) are names retained on the modern Norwegian map. *Knockdow Cove* (like Lamont Island, named by Petermann) is replaced by *Dianahamna* on Halvmanöya (Halfmoon Island), facing *Dianabukta* on Edgeöya (Edge Island). Since reindeer place-names are too common, Rendalen, north of Dianabukta, has been changed to *Dianadalen*.—Ed.]

EXTRACT FROM "YACHTING IN THE ARCTIC SEAS"

"In spite of a strong tide against us we dropped anchor in Advent Bay, late in the evening [Spitsbergen, July 1869.—Ed.]. We had steamed more

than half-way through this great fjord, and found here a sheltered nook with splendid holding mud in four fathoms of water.

I contemplated some days' detention here, and the meteorological instruments were, therefore, got out and fixed in a hastily-constructed observatory on shore. A guy, made to represent a sportsman taking aim, was added to keep the birds from picking at the shining bulbs of the thermometers. The ship lay about three-hundred yards from a level plateau, smooth like a well-kept glacis, and gently sloping from a line of earth-work. It was the form taken by the *débris* carried by a former torrent. The plain was thick with a variety of flowers in bloom. The level ground near the shore was chiefly occupied by the golden tufts of a species of cinquefoil (*Potentilla nivea*), by the brilliant purple petals of one of the saxifrages (*S. oppositifolia*) and its allies (*S. caespitosa* and *S. hyperborea*), and by representatives of the stitchworts (*Stellaria humifusa*) and fly-catchers (*Silene acaulis*). On the drier ground were found specimens of sand-wort (*Arenaria norvegica*), of chickweed (*Cerastium Alpinum*) and of another stitchwort (*Stellaria Edwardsi*). In some places, where the soil appeared too poor to sustain any growth, the eye was dazzled by fields of yellow poppy (*Papaver nudicaule*). On the slopes formed by the *débris* of the cliffs, which had disintegrated to form a very fair soil, the ground was even more closely clad in a variegated robe. The botanist of our party found saxifrages (*S. cernua*), fly-catchers (*Lychnis apetala*), persicaries (*Polygonum viviparum*), the four-angled cassiope (*Cassiope tetragona*), three species of whitlow-grass, the hairy mouse-worts [*sic*] (*Pedicularis hirsuta*), and the kidney-leaved Oxyria (*Oxyria reniformis*), associated with tufts of the Arctic and annual meadow-grasses (*P. Arctica* and *P. annua*)."

A SPITSBERGEN HERBARIUM

By I. W. Hutchison, F.R.S.G.S.

An interesting presentation to the Royal Scottish Geographical Society has recently been made through the generosity of Miss Augusta Lamont and Sir Norman Lamont, Bt., of Knockdow. It is a small collection of arctic flowers made in Spitsbergen in 1869 by their father, Sir James Lamont, on his Spitsbergen expedition of that year.

The collection, which is contained in a beautifully bound leather album, is in two parts. In the first part, entitled "Flowers from Spitzbergen," there are twenty-five species, each mounted on a separate page, with name and habitat written underneath in exquisite penmanship. These specimens comprise such arctic types as *Ranunculus nivalis; Papaver nudicaule; Silene acaulis; Cerastium alpinum; Stellaria humifusa;* and the beautiful *Saxifraga cernua*, common also, like most of the others, in Greenland, and which still survives in Britain on Ben Lawers, one of about sixty-two true arctic species which probably survived the ice-age in our island.

The second part of the album (marked "Flowers from Spitzbergen, 1869") contains a number of mounted but unlabelled specimens, one of which is marked "N. Zemlya." It contains some interesting Polemoniums, saxifrages, poppies and others, to the number of about twenty. Dr. Nicholas Polunin, Keeper of the Herbarium at Oxford University, described [1] various small collections of dried flowers brought home by Sir Edward Parry and others in the early part of the nineteenth century. Most of these (which

were presented to the Manchester Museum by the late Dr. James Cosmo Melville, who inherited them from the grandson of the navigator) are from the Canadian Arctic, but the third may include at least one interesting Spitsbergen species (*Salix polaris*), Parry having visited Spitsbergen before and after his expeditions to the North West Passage region. " In the past " (writes Dr. Polunin) " it was rather the custom to make on Arctic exploring expeditions small collections of ' dried flowers ' for one's friends as well as for public or private institutions." One of the Parry collections, for instance, bears the label " Dried Plants brought by Sir Edward Parry from Port Bowen, 1825. Presented to Elisabeth Gurney."

In the small Lamont collection now in the possession of the R.S.G.S. there is similarily included an envelope addressed to Mrs. Lamont, containing some loose specimens " with love from James " which seems to infuse the dried leaves once more with the warm breath of life. " I cannot help thinking " (remarks Dr. Polunin) " that there must be many more sets of Arctic plants scattered around . . . with some exceptions I have seen and revised only those arctic herbaria that are housed in big herbaria in Europe and North America. From readers who may possess or know of any more I would much like to have details and perhaps a brief loan ; and if any such collections are in need of a home, either temporary or permanent, we can offer them a good and safe one."

The interesting gift to the R.S.G.S. is just one of such hitherto little-known early collections made by a Scottish explorer, and as such is of distinct interest and value to the Society.

[1] Polunin, N. " On Some Early Collections of Arctic Plants." *The North Western Naturalist*, September 1942 : 168-173.

NOTES AND REFERENCES

EUROPE

INLAND WATERWAYS. A preliminary report on inland waterways has been prepared by L. T. C. Rolt for the Association for Planning and Regional Reconstruction (1946, Report No. 41 : 11 pp.), and deals with the historical background, present survey, methods of operation, principles of waterway construction and water supply and maintenance, abandoned canals, pleasure traffic, and some recommendations.

THE GEOLOGICAL RESULTS OF THE SEARCH FOR OILFIELDS IN GREAT BRITAIN. By G. M. Lees and A. H. Taitt. *Quarterly Journal of the Geological Society of London*, 1946, 101 (*3-4*) : 255-313. 5 plates. 13 figs. Discussion : pp. 314-317. 17 references.

THE HIGHLAND PROBLEM AND CONSTRUCTIVE POLICY. " The point of view is put forward that the Highlands could support from two to three times the present population from traditional occupations of agriculture, pastoralism, forestry, fishing and knitting and weaving, supplemented by the tourist traffic. There need be no heartbreak at urban industries not being developed. Rural life breeds men ; the industrial town consumes them." (F. Fraser Darling, *Today and Tomorrow*, 1946, 1 (*2*) : 16-20.)

ECONOMIC GEOLOGY OF CANONBIE COALFIELD. The Canonbie coalfield (Dumfriesshire and Cumberland), partly exposed and partly concealed, is important on account of its large reserves. Both mining operations and geological investigations have provided information incorporated in a pamphlet by B. Hilton Barrett and Dr. J. E. Richey, with assistance from W. E. Graham (Fcap. Pp. 51. 9 figs. Geological Survey Wartime Pamphlet No. 42, 1945). The detailed account of the stratigraphy of the region is illustrated by sketch-maps and sections. Other chapters deal with products of economic value other than coal. In the appendices are discussed the zonal range of lamellibranchs of the coal measures (by Professor Trueman) and the fossil plants (by Dr. R. Crookall).

STREAM PROFILES IN THE VALE OF EDALE, DERBYSHIRE. By W. V. Lewis. *Proceedings of the Geologists' Association*, 1946, 57 (*1*) : 1-7. 4 figs.

THE PATTERN OF THE ANGLO-SAXON SETTLEMENT OF RUTLAND. By W. L. Sargant. *Geography*, 1946, 31 (*2*) : 62-65. 1 fig.

THE VALLEY SYSTEM OF LYME REGIS. By Muriel A. Arber. *Proceedings of the Geologists' Association*, 1946, 57 (*1*) : 8-15. 1 fig. 4 photographs.

THE SETTLEMENTS OF THE CELTIC SAINTS IN SOUTH WALES. By E. G. Bowen. *Antiquity*, 1945, 19 (*76*) : 175-186. 10 sketch-maps.

THE SITE OF DUBLIN. By J. P. Haughton. *Geographical Society of Ireland, Bulletin*, 1946, 1 (*3*) : 53-46. Sketch-map of site of Dublin, 1673 and 1945.

THE WICKLOW MOUNTAINS. By J. B. Malone. *Geographical Society of Ireland, Bulletin*, 1946, 1 (*3*) : 56-58. Sketch-map, showing roads and upper limit of settlement.

THE GRAIGUENAMANAGH BASIN. Topography, structure, land utilisation, and the agricultural community of an area of some fifteen square miles, drained by the river Douske and its tributaries to the Barrow, are described by T. W. Freeman in the *Bulletin* of the Geographical Society of Ireland (1946, 1 (*3*) : 61-77. 3 figs.). Information on the life and development of the town of Graiguenamanagh is included. Built-up areas in 1902 and 1945 are shown on a map ; geology and land utilisation in the basin are also mapped.

NORWEGIAN PLACE-NAMES IN MEDIAEVAL MAPS. By M. Sørlie. *Norsk Geografisk Tidsskrift*, 1944, 10 (*3*) : 81-103. 9 maps.

THE TOBACCO INDUSTRY OF BELGIUM. By S. W. E. Vince. *Geography*, 1946, 31 (*1*) : 10-23. 5 maps.

FRENCH GEOGRAPHY IN WARTIME. By Jean Gottmann. *Geographical Review*, 1946, 36 (*1*) : 80-91.

THE RAILWAY FROM PARIS TO TOULOUSE : A GEOGRAPHICAL STUDY. By Ph. Duchemin. *Annales de Géographie*, 1945, 53-54 (*296*) : 274-293. 4 figs.

CHAMBÉRY. A study, documented by 166 references, of the region, site, development, and functions of the capital of Savoy (J. Gillio, *Revue de géographie alpine*, 1946, 34 (*1*) : 1-55 ; (*2*) : 267-311) is of more than local interest. As a commercial and residential centre, Chambéry has in recent years attracted an increasing number of immigrants from other parts of France and also foreigners, the latter forming eleven per cent. of the population in 1931. The development of hydro-electric power has stimulated the development of regional industries.

RURAL SETTLEMENT IN THE COASTAL PLAIN OF BAS LANGUEDOC. By S. Agnew. *Geography*, 1946, 31 (*2*) : 65-74, 77. 4 figs.

POPULATION OF SPAIN. The evaluation of changes in the distribution of the population in Spain is rendered difficult by changes in regional grouping for census purposes. The results of the (decennial) census of 1940 are studied in detail in *Estudios Geográficos* (1945, 6 (*18*) : 67-120) by A. M. Ruiz de Gordejuela. In addition to vital statistics, which include data as for the origin (local, provincial, foreign) of the population, housing statistics are also tabulated and discussed.

PLANT GEOGRAPHY OF NAVARRA. By D. Nagore. *Estudios Geográficos*, 1945, 6 (*19*) : 241-259. 5 sketch-maps.

THE LOESS REGIONS OF CENTRAL EUROPE IN PREHISTORIC TIMES. By A. Garnett. *Geographical Journal*, 1945, 106 (*3-4*) : 132-143.

GERMAN GEOGRAPHICAL LITERATURE 1940-1945. By E. Fischer. *Geographical Review*, 1946, 36 (*1*) : 92-100.

THE RUHR COAL-MINING DISTRICT. Information anent the extent and character of the Ruhr coal-field, the development of mining and of the iron and steel industry, the manufacture of coal derivatives, and production, is contained in an article by C. D. Harris (*Geographical Review*, 1946, 36 (*2*) ; 194-221. 11 maps). The maps show contours, geology (and cross sections), areal advance of coal mining during 1840-1940, built-up areas and transportation systems, industrial employment, coal and coke production (1937), and location of synthetic ammonia and petroleum plants and of tar distilleries.

EARTHQUAKES IN SWITZERLAND. By E. Tillotson. *Nature*, 1946, 157 (*3991*) : 562-563.

REFORESTATION IN SWITZERLAND. Soil conservation in Switzerland between 1876 and 1943, with special reference to afforestation, is reviewed by J. L. Biolley (*Revue pour l'étude des calamités*, 1945, 8 (*22*) : 3-25). During that period some 156,000,000 trees (72 per cent. coniferous) were planted, due regard being paid to research on plant succession and on permeability of woodland and agricultural soils in relation to the danger of avalanches, flooding, and erosion.

POLITICAL-ADMINISTRATIVE DIVISIONS OF THE U.S.S.R., 1945. The most important changes recently effected in the administrative and territorial organisation of the Soviet Union are reviewed by Th. Shabad in the *Geographical Review* (1946, 36 (*2*) : 303-311). The present divisions are listed, and shown on a map (1 : 22,000,000). A number of place-names have been changed, *e.g.* in 1944, Schluesselburg to Petrokrepost, Peterhof to Petrodvorets. Ordzhonikidze, formerly Vladikavkaz, has been renamed Dzaudzhikau, a name of Osetian origin. Voroshilovsk in the Caucasus is now Stavropol, in order to avoid confusion with Voroshilovsk in the Donets Basin.

ASIA

TREBIZOND AND NORTH-EASTERN TURKEY. By D. A. H. Wright. *Journal of the Royal Central Asian Society*, 1946, 33 (*2*) : 121-132. Sketch-map.

DEMOGRAPHIC PROBLEMS OF THE LEBANON. By E. Epstein. *Journal of the Royal Central Asian Society*, 1946, 33 (*2*) : 150-154.

A JOURNEY IN THE YEMEN. By H. Ingrams. *Journal of the Royal Central Asian Society*, 1946, 33 (*1*) : 58-69.

THE KURDISH QUESTION. The distribution and difficulties of the Kurds in Turkey, Persia, Iraq, Syria, and Russia are reviewed by W. G. Elphinston in *International Affairs* (1946, 22 (*1*) : 91-103. Sketch-map). The chief obstacle to the creation of an autonomous Kurdistan is the reluctance of the Kurds to unite among themselves. As they desire freedom to use their own language and follow their own traditions, the Kurds, though members of different States, may retain cultural autonomy. "The fact that there is no immediate prospect of establishing an independent Kurdistan is, however, no reason for dismissing the Kurdish problem as unworthy of further consideration."

SOVIET AZERBAIJAN. By M. Philips Price, M.P. *Journal of the Royal Central Asian Society*, 1946, 33 (*2*) : 188-200.

OIL IN THE MIDDLE EAST. The extent and potentialities of the oil resources in the Middle East are discussed by Dr. G. M. Lees in the *Journal of the Royal Central Asian Society* (1946, 33 (*1*) : 47-57. 4 figs.). The various oil concessions are briefly described and shown on a map. A geological section through a typical anticlinal oilfield is also given, and there is a diagram, taken from *World Petroleum* (March, 1945), showing percentage of oil production by countries and continents.

THE NOMADIC TRIBES OF PERSIA TO-DAY. By O. Garrod. *Journal of the Royal Central Asian Society*, 1946, 33 (*1*) : 32-46.

THE OILFIELDS OF INDIA AND BURMA. By P. Evans. *Journal of the Royal Society of Arts*, 1946, 94 (*4717*) : 369-377. Sketch-map. Discussion : pp. 377-379.

GEOGRAPHICAL NOMENCLATURE IN SIAM. By Helen L. Smith. *Geographical Review*, 1946, 36 (*2*) : 264-269.

NEW DATA ON CENTRAL ASIA. By courtesy of the Soviet News Press Service, a note has been received in which V. Perevalov, Member of the All-Union Geographical Society, gives a popular summary of data published in *Izviestia Vsesojuznoho Geographicheskoho Obshchestva*, 77 (*3*), and relating to the Trans-Altai Gobi. The Scientific Committee of the Mongolian People's Republic, which had organised expeditions in 1924-1937, was responsible, in conjunction with the Mongolian State University, for further exploration in 1943. This expedition (including A. G. Bannikov, E. M. Murzaev, A. A. Yudatov, and D. Tzybigmid) covered a distance of about 2500 miles (July-September), taking in the area "to the south of the Mongolian and Gobi Altai, between Noyan-Samon in the east and Dzarman in the west, *i.e.*, from 96° to 100° E., and between 42° 15′ and 45° N.," a typical Central Asian desert region, with a range of altitude between about 2300 feet and a peak of 8865 feet. A number of mountain ranges (Tostu, Tsagan-Bogdo, Genghiz, and several others) were mapped by the expedition. The slopes of these mountains are furrowed by deep canyons. "Parallel to these ranges lie hollows at the bottom of which small salt lakes, sometimes quite dried up, are frequently met with." The sloping plateaux are intersected by the beds of seasonal waterways. The climate is characterised by dry windy springs, hot summer with cool nights, a dry autumn, and very low temperatures in winter. The flora of the region is typical of Central Asian deserts, scanty and monotonous, except in the canyons, where, for instance, poplars may be seen. The fauna "is comparatively rich. The travellers met groups of wild camels and Przevalski's horse."

CLIMATE AND CHINA'S AGRICULTURAL INDUSTRY. By Liu En-Lan. *Journal of Geography*, 1946, 45 (*3*) : 90-96.

THE INDUSTRIALISATION OF CHINA. By G. K. C. Yeh. *Journal of the Royal Central Asian Society*, 1946, 33 (*1*) : 9-24.

AFRICA

THE KHAMSIN IN NORTHERN EGYPT. By A. Birtwistle. *Geography*, 1946, 31 (*2*) : 59-62.

RHYTHM OF NATIVE LIFE AND SEASONAL MIGRATIONS IN CHAD. By M. Mazoudier. *Annales de Géographie*, 1945, 53-54 (*296*) : 296-299.

FURTHER NOTES ON THE KIBO INNER CRATER AND GLACIERS OF KILIMANJARO AND MOUNT KENYA. By Lieut.-Commander P. C. Spink, R.N.V.R. *Geographical Journal*, 1945, 106 (*5-6*) : 210-216. 14 photographs. 2 diagrams. [Cf. *S.G.M.*, 61 (*1*) : 24.]

LAKE TANGANYIKA. The chemical composition of the inflows and lake water, and the thermal stability of Lake Tanganyika, are discussed in relation to hydrobiological problems, by R. S. A. Beauchamp (*Nature*, 1946, 157 (*3981*) : 183-184). An earlier (1939) paper by the author provides a more detailed account of the hydrology, and a list of references.

BELGIUM'S WORK IN RUANDA-URUNDI. *African World*, April, 1946 : 34.

ETHNOGRAPHY OF SPANISH GUINEA. By A. de Unzueta y Yuste. *Estudios Geográficos*, 1945, 6 (*19*) : 261-299. 9 photographs. 6 sketch-maps.

PROGRESS IN GEOLOGICAL INVESTIGATIONS AND MINERAL DEVELOPMENTS IN THE GOLD COAST. By N. R. Junner. *Bulletin of the Imperial Institute*, 1946, 44 (*1*) : 44-62. Simplified geological map of the Gold Coast and Togoland under British Mandate (approx. 21 miles to one inch). Map of mineral deposits (approx. 30 miles to one inch).

A PICTORIAL RECORD OF THE BANTU TRIBES. An article in *The African World* (April, 1946 : 24-26) deals with the Duggan-Cronin Bantu Gallery at Kimberley. The collection includes 3600 half-plate photographs and over 700 enlargements illustrating life among all the major tribes of southern Africa, the result of twenty years' studies by Mr. C. M. Duggan-Cronin. A few of these photographs are reproduced in the article.

THE WARM SPRINGS AT LOUBAD, NEAR NYLSTROOM, TRANSVAAL. By L. E. Kent. *Transactions of the Royal Society of South Africa*, 1946, 31 (*2*) : 151-168. 3 figs.

THE POPULATION OF MADAGASCAR. A map (1 : 13,300,000) showing the density of population in Madagascar in 1936 is discussed by P. Gourou in *Annales de Géographie* (1945, 53-54 (*296*) : 299-301), with special reference to a study, by R. Decary and R. Castel, of the consequences of recent native internal migrations (pp. 48. Tananarive : Imprimerie officielle, 1941). This redistribution of the population, due to economic and political factors, is on a considerable scale, particularly towards the easily irrigated alluvial lands in the west, and necessitates the preparation of a new density map.

AMERICA

THE CHAMPLAIN TRAIL. By L. Harrington. *Canadian Geographical Journal*, 1946, 32 (*4*) : 150-165. 26 photographs. Map of Champlain's route, 1615-1616.

ONTARIO SURVEYS AND THE LAND SURVEYOR. By W. F. Weaver. *Canadian Geographical Journal*, 1946, 32 (*4*) : 180-191. 22 figs.

MOUNT EISENHOWER. The isolated Cambrian mountain (9390 feet) rising from the Bow River valley between Banff and Lake Louise was believed by the Indians of the plains to be the home of the Chinook, and owing to its shape was aptly named Castle Mountain by the Palliser Expedition in 1857. Renamed Mount Eisenhower, this mesa-like feature is described by R. E. Edwards in the *Canadian Geographical Journal* (1946, 32 (*2*) : 59-62. 2 photographs. Map, 10 miles to 4 centimetres, and geological sketch-map).

SEARCH FOR POWER IN THE BRITISH COLUMBIA COAST RANGE. By R. C. Farrow. *Geographical Journal*, 1945, 106 (*3-4*) : 89-117. 4 figs. 9 photographs.

WEATHER AND CLIMATE OF THE NORTHWEST TERRITORIES. By J. L. Robinson. *Canadian Geographical Journal*, 1946, 32 (*3*) : 124-139. 22 photographs. 7 figs. Map of Arctic and Sub-Arctic Canada (showing weather stations, 10-inch and 20-inch isohyets, northern limit of trees).

THE COPPERMINE. The routes of Samuel Hearne (of the Hudson's Bay Company) from Prince of Wales Fort at the mouth of the Churchill, to Bloody Falls at the mouth of the Coppermine River, Coronation Gulf, in 1771, and thence, via Great Slave Lake and Slave River, back to Hudson Bay in 1772, are shown on a map illustrating a note by L. J. Burpee in the *Canadian Geographical Journal* (1946, 32 (*3*) : 146-147). Some of the country lying between these routes still remains unexplored.

CITIES AND TOWNS OF ALASKA, By E. R. v. KUEHNELT-LEDDIHN. *Geographical Review*, 1946, 36 (*2*) : 270-290. 15 figs.

BOTTLE SPRINGS. The occurrence of diatoms and luxuriant growths of green algae near the shore and below the surface of salt lakes indicates the presence of fresh-water springs. Such perennial springs, occurring close to fissures or delta deposits along the shore of the Stansbury Peninsula, Great Salt Lake, have been described by R. L. IVES (*Journal of Geology*, 1946, 54 (*2*) : 123-125. 1 fig.). Indians made use of them before the white settlement of Utah, and local ranchers obtain fresh or potably brackish water by lowering a corked empty bottle in the salt water until the mouth is directly over the spring and then uncorking, filling, and recorking the bottle—hence the popular name. Submerged springs occur in many other localities. The presence of such springs suggests the need for a revision of estimates of fresh-water inflow into salt lakes, and also that fresh-water fossils may occur in deposits adjacent to springs regardless of the salinity of surrounding waters.

UPLAND TERRACES IN SOUTHERN NEW ENGLAND. By G. F. ADAMS. *Journal of Geology*, 1945, 53 (*5*) : 289-312. 10 figs.

POPULATION PROBLEMS IN THE CARIBBEAN ISLANDS AND IN CENTRAL AMERICA. Vital statistics (1940) are tabulated and discussed by A. P. LEON and A. ALDAMA in *Boletín de la Sociedad Mexicana de Geografía y Estadística*, 1946, 61 (*1*) : 3-10. 6 graphs : mortality in Mexico, Costa Rica, and El Salvador (1923-1943) ; infantile mortality ; birth rate ; population (1780-1940) ; population trend in Mexico ; age distribution in Mexico and Costa Rica.

A DESCRIPTION OF SONORA, By J. DE DIOS BOJORQUEZ. *Boletín de la Sociedad Mexicana de Geografía y Estadística*, 1946, 61 (*1*) : 11-35.

SOME DATA CONCERNING THE GEOGRAPHY OF THE STATE OF ZACATECAS. The results of geodetic surveys and meteorological records, and full information on the boundaries of the State of Zacatecas, are embodied in a memoir designed to provide data, some little known, for reference in future regional studies. (M. MEDINA, *Boletín de la Sociedad Mexicana de Geografía y Estadística*, 1946, 61 (*1*) : 55-163. Map of Zacatecas, revised in 1942 by the Geographical Department of the Ministry of Agriculture).

THE MINERAL WEALTH OF BRAZIL. By S. FRÓES ABREU. *Geographical Review*, 1946, 36 (*2*) : 222-246. 21 figs., including maps showing mineral resources in active exploitation (1944), population density (1940), geology, and physiography of Brazil.

OCEANIA

DIFFERENT TYPES OF ISLAND ARCS IN THE PACIFIC. By J. H. F. UMBGROVE. *Geographical Journal*, 1945, 106 (*5-6*) : 198-209. 4 figs.

RECENT VOLCANIC ERUPTIONS IN PAPUA. In a preliminary note on volcanic eruptions in the Goropu Mountains, south-eastern Papua, during the period December, 1943, to August, 1944 (*Journal of Geology*), 1946, 54 (*1*) : 19-31. 5 figs.), G. BAKER reviews eyewitness reports and describes the phenomena and the new vents. No volcanic phenomena had previously been reported from this locality, though lava flows have occurred about 65 miles to the west-north-west. Volcanic zones and other structural elements in the New Guinea area are discussed in relation to the distinctive characters of the Goropu region. Gas, steam, and fine ash are the principal constituents emitted, the ash being conveyed a considerable distance. Examination of the andesitic lapilli indicates that the eruptions are of the destructive variety associated with a very deep magma chamber and very high gas pressure.

AUSTRALIA IN EMPIRE AIR TRANSPORT. The first aeroplane flight in Australia was made by Houdini in 1910, who flew for about two miles in three and a half minutes. In 1919, Ross and Keith Smith completed the journey from England to Australia in 27 days 20 hours, and the Lancastrian service at present does the Hurn-Sydney run in 62 hours. The fascinating story of the genesis of the Empire air services and modern development and opportunities is told by W. H. FYSH, D.F.C. (*Journal of the Royal Aeronautical Society*, 1946, 50 (*421*) : 21-72). His informative article is illustrated by numerous photographs and graphs, and by maps showing Australia's internal air routes (1945), projected air-routes in Australian home waters and within New South Wales, and Australian-New Zealand air services, also the main overseas routes in which Australia is interested.

THE WEALTH OF CENTRAL AUSTRALIA. By M. CUTLACK. *Queensland Geographical Journal*, 1944-1945, 49 : 33-49.

AUSTRALIA'S GREAT BARRIER REEF. By E. O. HOPPÉ. *Canadian Geographical Journal*, 1946, 32 (*1*) : 14-20. 15 photographs. Sketch-map.

TIME SCALES IN THE DEVELOPMENT OF TASMANIAN PHYSIOGRAPHY. By A. N. LEWIS. *Papers and Proceedings of the Royal Society of Tasmania*, 1944 : 19-39. Maps showing main structural sub-divisions and rock groups of Tasmania. 2 plates. 15 references.

PLEISTOCENE GLACIATION IN TASMANIA. By A. N. Lewis. *Papers and Proceedings of the Royal Society of Tasmania*, 1944 : 41-56. Map showing glaciated areas and fluvio-glacial extensions. Diagram. 22 references.

EARLY TOWN PLANNING IN HOBART. By C. Craig. *Papers and Proceedings of the Royal Society of Tasmania*, 1944 : 99-108. Map of Hobart Town, 1826.

NEW ZEALAND IN THE WORLD ECONOMY. By L. Webb. *International Affairs*, 1946, 22 (*2*) : 174-186.

POLAR REGIONS

NUCLEAR ENERGY AND THE POLAR ICECAP. In a letter to the Editor of *Science* (1946, 103 (*2671*) : 316), R. T. Ellickson, of the Polytechnic Institute of Brooklyn, points out the absurdity of recent statements to the effect that the polar icecaps can now be melted by means of atomic bombs. The author estimates that four billion tons of U-235 would be required, at a cost of over $10,000 per pound. Using 10,000 uranium piles, each dissipating 1,000,000 kilowatts, the icecap could be melted in about one million years.

CENTENARY OF THE SAILING OF SIR JOHN FRANKLIN WITH THE *EREBUS* AND *TERROR*. I. Sir John Franklin's orders considered in the Light of Geographical Knowledge when he sailed, 1845. By R. J. Cyriax. II. The North West Passage since the Last Franklin Expedition. By J. M. Wordie. *Geographical Journal*, 1945, 106 (*5-6*) : 169-180, 180-195. Discussion : 196-197. 5 illustrations. Map of the North West Passage region as known in 1845. Map, showing tracks of the *St. Roch*, 1940-42 and 1944. [Cf. *S.G.M.*, 60 (*3*) : 86 ; 61 (*2*) : 58, 65.]

CARTOGRAPHY

LANDFORM, LANDSCAPE, LAND-USE, AND LAND-TYPE MAPS. By E. Raisz. *Journal of Geography*, 1946, 45 (*3*) : 85-90. 3 figs.

MAP PROJECTIONS USED IN NORWEGIAN GEOGRAPHICAL SURVEYS. By K. S. Klingenberg. *Nordisk Geografisk Tidsskrift*, 1944, 10 (*3*) : 104-113. 1 fig. English summary : pp. 115-116.

HISTORICAL ATLAS OF THE DAUPHINÉ. An atlas, containing maps (1 : 200,000 and 1 : 320,000) illustrating the distribution of place names, dioceses, seigneuries, districts, population, and agricultural and industrial production in the Dauphiné, is adumbrated by J. de Font-Réaulx (*Revue de Géographie alpine*, 1946, 34 (*2*) : 243-265). To effect a synthesis of the scattered material published and in manuscript is a considerable task. However, many maps are available at the University and the Institute of Alpine Geography at Grenoble. In other archives are available an abundance of data, for the compilation of maps of population density in the fifteenth century, for instance.

THE MILLIONTH MAP OF HISPANIC AMERICA. By I. Bowman. *Science*, 1946, 103 (*2672*) : 319-323.

GENERAL

AN ESTIMATE OF THE AGE OF THE EARTH. By Prof. A. Holmes. *Nature*, 1946, 157 (*3995*) : 680-684. 2 figs.

GEOMORPHIC TERMINOLOGY AND CLASSIFICATION OF LAND MASSES. By A. N. Strahler. *Journal of Geology*, 1946, 54 (*1*) : 32-42.

GEOLOGY IN EMBRYO (up to A.D. 1600). By C. E. N. Bromehead. *Proceedings of the Geologists' Association*, 1945, 56 (*2*) : 89-129. Bibliography : 129-134.

MINERAL RESOURCES OF THE WORLD (EXCLUDING FUELS AND WATER). By D. Williams. *The Advancement of Science*, 1945, 3 (*10*) : 206-221. 1 fig.

THE ROLE OF PLANTS IN GEOGRAPHY. By G. F. Carter. *Geographical Review*, 1946, 36 (*1*) : 121-131.

CLIMATIC HISTORY AND POLLEN ANALYSIS. Research on the relation between pollen profiles and climatic conditions in inter- and post-glacial times is reviewed by L. von Post in *Ymer* (1944, 64 (*2*) : 69-113. 14 figs.). In sketching the progress of investigations from those by Blytt and Sernander in Scandinavia onwards, the importance of pollen analysis in Scotland (by Dr. George K. Fraser) is duly acknowledged, and climatic parallelism in different parts of the world is discussed with reference to various theories put forward. Minor paleoclimatic fluctuations in Sweden are also considered in relation to local pollen profiles.

SOCIAL GEOGRAPHY AND ITS PLACE IN COLONIAL STUDIES. By E. W. Gilbert and R. W. Steel. *Geographical Journal*, 1945, 106 (*3-4*) : 118-131.

REVIEWS OF BOOKS

EUROPE

The New Europe : An Introduction to its Political Geography. By WALTER FITZGERALD. Demy 8vo. Pp. x+256. 28 sketch-maps. London : Methuen and Co. Ltd., 1945. *Price* 14*s.*

Political geography, as defined by the author, is the study of the organisation and inter-relationship of states conditioned by geography ; and, always with reference to this setting, he discusses the evolution of the national states of Western Europe and the still more complicated matter of nationality in Central and Eastern Europe. There are no natural frontiers ; frontiers are of political or military origin ; and in the settlement of 1919, excessive consideration of national susceptibilities obscured the inherent economic unsoundness of many decisions that might have been avoided, if only statesmen and their advisers had been aware of the geographical facts.

Investigation into the distribution of population and the land-hunger characteristic of certain regions (*e.g.*, Southern Italy) raises the general question of the extent to which any people is entitled to occupy territory that it cannot, or does not, exploit. In view of the vast populations of the Soviet Union and of the U.S.A., of the endless, almost untapped resources of the former and the increasing penetration of the Old World of the latter, the only hope for the continued influence of Western Europe on the old level of international affairs would appear to lie in some federation comparable to either of those two great world-states.

There are good bibliographies, an index, and many useful sketch-maps. R. T. C.

Our Woodlands : Their Sacrifice and Renovation. By C. P. ACKERS. Foreword by Lord Phillimore. Demy 8vo. Pp. 30. London : Torchstream Books, 1945. *Price* 1*s.*

" There is probably less real forest-sense in this country " (writes Mr. Ackers) " than in any other in Europe. One of our main post-war forest duties will be to educate the general public, rural and urban alike, to become forest-minded." No better beginning could be made than by studying this valuable booklet. Beginning with a masterly survey of some pre-war aspects of our neglected timber production, the author points out the great suitability of the British climate for forestry. Unlike Denmark, Sweden, Finland, Germany, and other " timber-enlightened " countries, legislation to help timber growers and to improve production is almost entirely lacking in Great Britain. " We see therefore that those private owners, who have invested capital with little hope of profit, have twice saved their country from disaster."

Not in nationalisation of land, but in State and private forestry " going hand in hand, each learning from the other and all under due guidance and supervision," is an enlightened forestry policy to be sought. Post-war legislation is essential which will ensure continuity of treatment for long-term timber cropping, and which will, besides developing state forestry and the excellent work of the Forestry Commission, give more encouragement to the private grower. Mr. Ackers advocates the formation of one Forest Authority under whom are two distinct branches : (*a*) controlling State forests and woodlands, (*b*) controlling private and communal forests and woodlands. He also advocates the formation of " a body of recognised Forest Consultants, drawn largely from the ranks of our two Forestry Societies, and the formation of local Committees with full executive powers, modelled partly on the Swedish system."

This little book cannot be too highly recommended to the notice of all tree-lovers, as well as to all practical foresters, interested in post-war reconstruction of our woodlands.

I. W. H.

British Roads. By GEOFFREY BOUMPHREY. Crown 8vo. Pp. 184. 12 photographs. 6 maps. Discussion Books, No. 21. Edinburgh and London : Thomas Nelson and Sons Ltd., (1939) 1945. *Price* 3*s.* 6*d.*

This number of Nelson's Discussion Series tells the story of British roads from prehistoric times to the present day. The author traces in an attractive fashion the history of road making and the nature of the traffic occupying the roads throughout the ages. It is a pity, however, that, apart from a reference to General Wade's work, little or nothing is mentioned of Scotland. The last section of the book, dealing with modern roads, contains many interesting suggestions for the improvement of our roads both in town and country. Among the illustrations are four showing the various methods of road intersections on the Reichs-autobahnen.

A useful little book for the general reader and the discussion group. J. H.

Homes, Towns and Countryside : A Practical Plan for Britain. Edited by GILBERT and ELIZABETH GLEN MCALLISTER. With contributions by Sir Patrick Abercrombie, Sir Daniel Hall, L. Dudley Stamp, Sir Cecil M. Weir, Sir Charles Bressey, E. W. Smith, F. J. Osborn, Leopold Friedman, Ivor Brown, William A. Robson, and the Archbishop of York. Demy 8vo. Pp. xxx+170. Frontispiece. 62 plates. Bibliography. London : B. T. Batsford Ltd., 1945. *Price* 18*s.*

This book, ably introduced by Gilbert McAllister, M.P., is a series of essays by leading planners of town and country, and by others actively engaged upon intimately associated problems of industry, arts, and life. The book is of high standard throughout. Its diversity forms part of its interest and there is considerable harmony in the positive viewpoint taken up. As W. A. Robson writes, mere ' co-ordination ' is not enough. " The composer of a symphony does not ' co-ordinate ' a number of (solo) parts each written by other composers. . . . He invents the themes, and orchestrates them " throughout the score. So with planning : the Ministry of Town and Country Planning (and in Scotland the Secretary of State), after consultations, must " create the principal themes of a national plan for Parliament to approve." It is interesting to find a leading Scots industrialist, Sir Cecil M. Weir, pleading for a " Location of Industry Board " to utilise wartime experience in location, for re-location henceforward. Although a believer in private enterprise, he holds that Government should " claim the right to guide and direct (industry) in those spheres in which community interests predominate. And location is one of these."

Naturally the harmony is not complete and some essays may fail to link their subject with the task of physical planning as a whole. Sir Charles Bressey's chapter on " Transport " lacks concreteness in this respect. Dr. E. W. Smith's constructive chapter, " The Place of Fuel in National Planning," cannot readily be correlated with Weir's chapter, for lack of geographical perspective in either. Weir himself omits any mention of the Ministry of Town and Country Planning, and its present or potential part in industrial location. In a book of which the main theme is " a practical plan for Britain " there are no maps of Britain ; yet what the house plan is to the builder and his client, the map must be to the national planner and the community he serves. Nevertheless, these discordancies are part of the diversity and part of the interest of the book provided by a vital group of diverse authors.

A. G.

Rebuilding Britain—A Twenty Year Plan. By E. D. SIMON, M.A., LL.D., M.I.Mech.E., Hon. A.R.I.B.A. Crown 8vo. Pp. 256. 16 photographs. 5 figs. London : Victor Gollancz Ltd., 1945. *Price* 6*s.*

Sir Ernest Simon's long experience in housing and planning ensures that his views on rebuilding Britain merit the most careful consideration. The aim of the book is to show how by determination on the part of the public, by wise and efficient planning by the building industry, the local authorities and at least seven Government Departments, Britain can be rebuilt so that all are decently housed with easy access to places of work and recreation. The book naturally covers a very wide field, and many leading authorities were consulted by the author. Part 1 deals with building, the problems of labour and materials, with an interesting discussion on prefabrication and large-scale production. In Part 2, on housing, the author discusses the vexed question of private enterprise or local authority building. In the interval years speculative builders built 70 per cent. of all the houses, local authorities 30 per cent. Generally speaking the local authorities built working-class houses to let, private enterprise built larger houses for sale. Slum clearance houses were all built in the interval years by local authorities. Should private enterprise be called in to help with slum clearance ? The author doubts if the speculative builder would be willing to do this on a substantial scale, but he regards it as a great opportunity for housing associations.

Foreign examples of planning are taken from Moscow, the T.V.A., Los Angeles, New York, Zurich, and Stockholm to show what might be done in Britain. Having reviewed the field of building and housing, the author turns his attention to Planning in Britain and discusses its many problems—what size of town is desirable for efficient industry, administration, and cultural life. In studying the re-development of larger cities Manchester is naturally chosen.

This book, concisely written, should be read and kept for handy reference by all interested in or concerned with rebuilding Britain. A change of Government has altered the emphasis of certain aspects of the problem, but nonetheless the value of the book remains unimpaired. The illustrations are good and apt, while the appendices are valuable to the thinking reader.

J. H.

Small Nations. By ARCHIE LAMONT, M.A., Ph.D. $7\frac{1}{4}\times4\frac{3}{4}$ inches. Pp. 160. Glasgow : William Maclellan, 1944. *Price* 7*s.* 6*d.*

The author has no faith whatever in any large state and believes that the future of the world is with the small nations. The book is an uncompromising presentation of the

arguments for Scottish nationalism. By comparison with the Scandinavian lands, with Finland, Estonia, Latvia, and even with southern Ireland, Scotland is shown to be a very backward country indeed, her only hope of prosperity in days to come lying in rejection of English influence, of English civilisation, which is merely "cosmopolitan nothingness." Whether the reader accepts the general conclusion or not, the information given about the achievements, up to 1939, of the countries above mentioned is remarkable and worthy of very serious attention. The inclusion of Poland among the "small nations" is unfortunate.

R. T. C.

Wanderings in Lakeland. By WILLIAM T. PALMER, F.R.G.S., M.B.O.U., F.S.A.Scot. Crown 8vo. Pp. 143. 15 illustrations by John Hardman. London: Skeffington and Son Ltd. [1945]. *Price* 9*s.* 6*d.*

This is a collection of wayward and delightful memories set down by one who has spent forty years in Cumbria in close communion with the people of the moors and fells. His book, not designed for class-room or study, would fit the traveller's pocket or may be read with enjoyment by the fireside: it is a mine of reminiscence abounding in humour and full of old country lore.

R. T. C.

Coventry: Six Hundred Years of Municipal Life. By FREDERICK SMITH, B.A., F.G.S. Royal 8vo. Pp. viii+210. 28 illustrations. 3 plans. Coventry: The Corporation of the City of Coventry, and The Coventry Evening Telegraph, 1945.

The history of the city which has given us the legend of Lady Godiva and the phrase "sent to Coventry" should elicit more than local interest. It is given here in an interesting and readable fashion: Coventry is seen as the mirror in which the history of England and the development of municipal government are reflected. To appreciate the early history of Coventry is to grasp its dual personality of Earl's Half and Prior's Half—manor and monastery, where separate and opposite claims have had a curious bearing on the development of the city almost to the present day. The dissolution of the monasteries was followed by that of the medieval guilds and chantries, and the city acquired their lands. Along with the old manor lands and abbey lands Coventry controls not only a considerable revenue, but has in its power to dispose of these lands as the City Council decides. The destruction in 1940 has cleared the nineteenth-century haphazard congestion, and it will be interesting to see what sort of town arises from the ashes.

There is only indirect reference to the industrial development of Coventry. However, there are photographs, and also plans of the mediaeval town with its common lands.

S. A.

Mountain Holidays. By JANET ADAM SMITH. 8½×5½ inches. Pp. 194. 35 illustrations. 2 sketch-maps. London: J. M. Dent and Sons Ltd., 1946. *Price* 15*s.*

The author was most fortunate in that she received her training in mountaineering, both physical and mental, from Professor W. P. Ker. She started young—at eight years of age—in Arran, when the senses are receptive, and even at this early age she learned that success on the hills is not inevitable. Thereafter she had experience in other parts of Scotland and finally in the Alps, first with guides and then guideless on less severe expeditions. She has had the ideal Alpine holiday, no luggage apart from a rucksack. She has climbed in many parts of the Alps, but mainly in Savoy, and there in winter on ski as well as in summer. Like most Scots, her love for the Alps has not lessened her love for her own hills.

The book is well written and the earlier chapters are specially enjoyable. The illustrations do not reach the standard of the text.

A. H.

Landsmen and Seafarers. By MAURICE LOVELL. 9×6½ inches. Pp. 64. 14 isotype charts. 32 photographs. London: George G. Harrap and Co. Ltd., 1945. *Price* 7*s.* 6*d.*

Any contribution towards international goodwill is welcome, and this first volume of three, edited by Professor John Macmurray, constitutes such a contribution. The author, who lived in Moscow from before the German invasion of Russia until 1942, compares and contrasts the Russian commonwealth of landsmen and our own commonwealth of seafarers, and in doing so provides a corrective for political fanaticism whether of the pro or the anti type. Co-operation is best promoted by mutual understanding of the significant similarities and differences "in the problems that nature and history have combined to set for the two great groups of peoples."

The coloured isotype charts admirably supplement the text, and so do the photographs.

J. H. K.

ASIA

Palestine : Land of Promise. By WALTER CLAY LOWDERMILK. With a Foreword by Sir E. John Russell. Crown 8vo. Pp. 167. 15 illustrations. Map. London : Victor Gollancz Ltd., 1944. Fifth Impression, April 1945. *Price* 4*s.* 6*d.*

Dr. Lowdermilk, assistant chief of the U.S. Soil Conservation Service, writes from the point of view of a land conservationist studying the relation of peoples to their lands. Although not a Jew, he views with enthusiasm the reclamation work of the Jewish colonists. The geographical and historical background of Palestine, its modern Jewish resettlement, and its agricultural and industrial developments are admirably outlined. A study is given of possible developments in the Jordan Valley, where the swift waters of the river might be diverted for irrigation and its steep face used for developing power, and in the Negeb and Trans-Jordania. The views of such a noted authority as Dr. Lowdermilk are worthy of careful study.

The author concludes with an estimate of Palestine's absorptive capacity, and in his opinion full utilisation of the Jordan Valley depression for reclamation and power would enable four million refugees from Europe to be absorbed in Palestine in addition to the one million eight hundred thousand Arabs and Jews already in Palestine and Trans-Jordania. However, comparatively little is said about the Arabs and their economy, and where comparison is made, it is to the disadvantage of the Arabs. This book on a thorny problem of to-day is worth reading. J. H.

India. Part I. Physical Basis of Geography of India. By H. L. CHHIBBER, M.Sc., Ph.D., D.Sc., D.I.C. Demy 8vo. Pp. xix+282. 10 plates. 19 figs. and maps. Benares : Nand Kishore and Bros., 1945. *Price Rs.* 5 or 9*s.*

The twenty chapters of this book summarise a variety of topics, from the physical divisions to aspects of geology. It is difficult to see reasons for the arrangement, the structure of India being left to the last chapter, whereas one might have expected to find this placed first. Two chapters on climate are inserted but inadequately linked to topography, of which climate is a causal factor. For example, the whale-backed hills or "inselbergs" of S.E. India (like the *kopjes* of S. Africa) are associated with climates having a marked drought alternating with heavy rain. The value of the book lies in its combination of some first-hand observation with general reading (no doubt limited by the poverty of libraries in India). Yet the author would have done well to study the contents and apply the method of recent works of regional physical geography in order to bring the perspective and sequence of modern geography to bear on his subject. While parts show maturity and first-hand knowledge, others include facts required in an elementary text-book of physical geography in India ; but rather too many sections read like a gazetteer, or like an old-fashioned "school" geography. The book is indexed. A. G.

Of Sea and Land. I. By TOM ASHLEY LAKEMAN. Demy 8vo. 62 photogravures and explanatory text. Interlude in Verse : 10 pp. London : Chapman and Hall Ltd., n.d. *Price* 12*s.* 6*d.*

Readers of *Kim*, as well as those who have sojourned in India, will like this book which bears testimony to a deep appreciation of village life in the plains and forms a sequel to the author's *Of Hills*. The second part records a journey through Kashmir and the Frontier, and these books may also be obtained bound in one volume.

The photogravures are of a high quality which would make it invidious to single out any for special comment. An added incentive to acquire them is that "the first profits . . . will go to Royal Tank Regiment Prisoners of War. As the war ends the Benevolent Fund will allot the money to help the men when they return." J. H. K.

Pioneer Settlement in the Asiatic Tropics : Studies in Land Utilization and Agricultural Colonization in South-eastern Asia. By KARL J. PELZER. 10×7 inches. Pp. xviii+290. 171 illustrations. 47 statistical tables. Bibliography. New York : American Geographical Society. Special Publication No. 29, 1945. *Price* $5.00.

All too little responsible literature is available on South East Asia, and therefore this special publication is assured of a wide welcome. The author has the advantage of personal knowledge over much of the region, and he backs his observations with expert opinion which is listed in a fourteen-page bibliography. In spite of this, the book lacks balance and cannot be considered a comprehensive survey of the whole of South East Asia. There is a disproportionate emphasis on Indonesia and the Philippines ; Indonesia gets serious consideration in certain sections only, Malaya is scrappily treated, while Borneo and Celebes receive only incidental mention.

The first part of the book, dealing with the land use, is, as far as possible, comprehensive. The description of the four representative economies—'hunting-gathering,' 'ladang' or shifting cultivation, sedentary cultivation (garden plots, 'wet' fields, 'dry' fields), and

plantation cultivation of European type—is the most enlightening that has yet been published. Each type is illustrated by numerous and excellent photographs. Among the problems most clearly defined are: the rapid deforestation consequent on shifting cultivation; over-population of the 'wet' lands and the necessity of extending irrigation systems by modern methods; soil erosion on the 'dry' field areas and the necessity of terracing to conserve the top soil; necessity of changing the 'clean' field methods used in the European-owned plantations: excessive weeding is leading to extensive sheet erosion.

It is in the second half of the book that the balance is lacking. In this section, the Philippines and Java are treated in great detail as regards population density, land tenure, and administrative policy. Methods to relieve the dangerous pressure of overpopulation are discussed: improved agricultural technique, movement away from the favoured wet lands to dry land cultivation, soil conservation, and colonisation of islands less densely populated. In the chapter comparing the success of such operations under Philippine and Indonesian administration, Java comes off second best. Much that is said of Indonesia explains the unrest and discontent that now prevails. S. A.

China. By T. L. Liang and Neville Whymant. Crown 8vo. Pp. 192. London: Macdonald and Co. (Publishers) Ltd., 1946. *Price* 5*s.*

This is one of the Cross Road Series, and is divided into five chapters, namely, General Characteristics of Chinese Civilisation, Bird's-eye View of Chinese History, The Impact of the West, Rise of Modern China (1911-1931), and Resistance and Reconstruction, the latter including the Articles of the Constitution of 1937. There is, however, much to be done before the new Constitution can come into full effect. There is a postscript, and two appendices deal with China's part at Dumbarton Oaks, and UNCIO at San Francisco. As the main part of the book is devoted to the Impact of the West, and events from 1911 onwards, this is a very useful little book.

Dr. Liang is a legal adviser to his Government, and Mr. Whymant was an Oxford Research Scholar in China and Japan. There is a preface by His Excellency the Chinese Ambassador in London. W. O. L.

Face to Face with China. By H. B. Rattenbury. Demy 8vo. Pp. 144. 45 photographs. 15 isotype charts. London: George G. Harrap and Co. Ltd., 1945. *Price* 10*s.* 6*d.*

Those who read the author's *China, My China* [cf. *S.G.M.*, 1945, 60 (*1*): 27-28] know that his heart is in China and that he has a sympathetic attitude to things Chinese. The present book is divided into twenty chapters, each dealing with some special aspect of Chinese affairs—for example, history, culture, people, education, government, etc. The history of China would fill very many volumes, but one chapter giving the main points puts the subject in a nutshell, and the other chapters deal similarly with their subjects. Comparisons made between Britain and China help towards a sympathetic understanding of China's position to-day. The author, by the way, refers to the staple food of the peasantry of North China as wheat; actually it is the tall millet, the stalks of which provide material for fuel, fences, roofing, and other purposes.

The photographs are admirably reproduced, and the coloured (isotype) charts, showing population for instance, are interestingly designed. This is a useful book for the general British reader, and a word of praise is due to the publishers for issuing it at a reasonable price considering the clear print, photographs, and charts. W. O. L.

China: Her Life and Her People. By Mildred Cable and Francesca French. Crown 8vo. Pp. 160. 76 photographs. 4 diagrams. Sketch-map and end-paper sketch-maps. London: University of London Press Ltd., 1946. *Price* 5*s.*

The names of the authors are a guarantee of the authenticity of this book, and of its worth. From beginning to end, every page is full of interesting facts concerning China and her indomitable people, and they are treated with the utmost sympathy and understanding. The range of subjects touched is very wide—the country itself; its history; the people, who "are sparing of all save trouble"; the customs—so many and varied, and so different from those of the West; the religions; human relations; and many other items which claim the attention of those interested in that great country of China.

The Chinese, as a people, have won the admiration of the world for the part they played throughout the weary and terrible years of war. Courage, high endeavour and faith brought them through. The world owes much to the China of the past, and the debt has not been lessened during the years of distress. The East and West can be mutually helpful to each other, and it is only by mutual understanding that this can be accomplished. This book can supply a strong link, and it is one that can be read with profit and interest by young people as well as those of maturer years. For study circles it will come as "a boon and a blessing," and for those whose life work will be in China, its helpfulness will be unlimited. It seems to answer all the questions in a simple yet sufficient way. Each chapter can stand alone—a story in itself. A. C.

AFRICA

Paysans d'Afrique Occidentale. By Henri Labouret. 9×5½ inches. Pp. 307. 16 plates. 11 figs. Paris: Librairie Gallimard, 1941 (6th ed.). *Price* 65 *fr.*

This study should be of the greatest value to students of West Africa.

After a comparatively brief account of the physical environment and of the constitution and distribution of the population, the author proceeds to a detailed description and study of the everyday life of the West African peasant, showing how the latter has adjusted himself to his surroundings, not only in his personal struggle to win a living but, in combination with his fellows, to ensure protection, social organisation, amusement, and a religious life to knit the whole together. The result is a more complete picture of the milieu, work, play, food, housing, and social life of the West African than can readily be found elsewhere.

There are many and excellent photographs, but there is a dearth of maps. R. M.

The Golden Age of West African Civilization. By Dr. R. E. G. Armattoe, F.S.A.Scot. Introduction by Prof. Dr. E. Schroedinger. Crown 4to. Pp. 96. 24 plates. Frontispiece. Londonderry: The Londonderry Sentinel (for The Lomeshie Research Centre for Anthropology and Race Biology), 1946. *Price* 8*s.* 6*d.*

The value of this publication lies mainly in that it brings together in its twenty-four plates some excellent illustrations of West African art in wood, bronze, and terra-cotta. The text bears little relation either to the title or to the definition of scope given in the preface. Apart from a vague thesis that a great civilisation once flourished in West Africa, the author's main contention is to show that the African is, or was, not inferior to the European. There are many irrelevancies, contradictions, and absurdities. There is a select bibliography running to five pages. R. M.

Skeleton Coast. By John H. Marsh. With a Foreword by the Rt. Hon. Field-Marshal J. C. Smuts, P.C., C.H., K.C., D.T.D. 8×5¼ inches. Pp. 148. 12 photographs. Map and end-paper map. London: Hodder and Stoughton Ltd., 1944. Reprinted, 1945. *Price* 7*s.* 6*d.*

The pages of history in recent years have been full of deeds of heroism. In this book, the fight and victory is not between man and man, but a struggle with the terrifying forces of nature, the indomitable spirit of man refusing to admit defeat. A wreck on the inhospitable and uninhabited coast north of Walvis Bay, in South West Africa, imperilled the safety of a hundred lives, and had it happened, say, forty years ago, nothing could have saved them from starvation and death, as had happened to others on this ill-fated coast. A wireless SOS made known their position, and soon steamers and planes went to their assistance, only to meet with frustration and disaster owing to the violence of the surf-beaten shores which made rescue by sea precarious, nay almost impossible; and the soft sandy desert 'bogged' down the bomber plane sent to bring them to safety. Eventually they were evacuated by convoys of motor trucks, sent from Windhoek, without the loss of a single life.

The author has given a well authenticated and graphic account of the thrilling experiences undergone by the shipwrecked party and of the untiring efforts of the rescuing parties. J. R.

AMERICA

Newfoundland: A Study of Settlement with Maps and Illustrations. By Griffith Taylor, B.E., B.A., D.Sc. 10×6¾ inches. Pp. 34. 14 figs. 33 photographs. Toronto: Canadian Institute of International Affairs, 1946. *Price* $1.00.

Professor Taylor's excellent study of settlement in Newfoundland opens with the remark: "Newfoundland is often described as the oldest British colony, so that it is rather surprising to find that it has been almost completely neglected by modern geographers." This study, well illustrated by maps, diagrams, and photographs, does much to make up for previous neglect. Beginning with a geological description of the island, the author touches on its main topographical features; its climate and agriculture; the early settlements, and its main towns and villages. There is everything in his succinct pages which a stranger to Newfoundland might wish to know (including the pronunciation of its name—Nee-oo'f'n-land) and much to enlighten residents. Though fishing and paper-making are its better-known industries, the sixth largest iron ore deposit in the world is on Bell Island, north-east of the village of Brigus (the latter famous to-day as the birthplace of the late Captain Bob Bartlett, friend and companion of Peary). This masterly paper is to be recommended to everyone anxious to obtain a short and clear account of this most interesting island, its geology, geography, and settlement. I. W. H.

We Live in Alaska. By CONSTANCE HELMERICKS. 8×5½ inches. Pp. 304. 7 woodcuts by Gwenda Morgan. End-paper map. London : Hodder and Stoughton Ltd., 1945. *Price* 12*s.* 6*d.*

This book describes an adventurous journey which Mrs. Helmericks and her husband Bud made by canoe in the latter half of 1942 on the Tanana, Lower Yukon and Kuskokwim rivers of Alaska. It is significant not only of the vast size of the Territory, but also of the secrecy of Army operations there, that while the canoe was being built at Seward on the Gulf of Alaska, the Japanese were bombing Dutch Harbour and landing on Attu and Kiska, yet no repercussion of these dire happenings prevented the courageous pair from realising their dream of a "delayed honeymoon" on the interior waterways of Alaska, where apparently little echo of the war reverberated.

The Helmericks were married in 1941 and left for Alaska by rail and steamboat an hour later. In the opening chapters the author describes her initiation into the life of the Territory. For the first year ("a period of devoted and awful labours") the newly-weds lived in a log cabin at Anchorage, and Mrs. Helmericks didn't like Alaska. How she learned to love the great fascinating land is described in the thrilling story of her canoe-journey with Bud down its interior waterways in their home-built but entirely seaworthy craft. Mrs. Helmericks makes many shrewd observations on native life, and on the white people, traders, missionaries, and teachers she encountered, and paints valuable word-pictures of the wild life in these little-visited regions. There are racy descriptions of perils and trials safely overcome, though they might well have daunted any hearts less stout. The journey was only halted by the freeze-up near Bethel on the Kuskokwim, reached from the Yukon by the little-used portage over from Russian Mission. The adventurous honeymooners eventually arrived at Seward by plane, after a voyage of nearly six months which had well earned for both the right to be enrolled in the honourable company of Alaskan pioneers.

I. W. H.

Datos etnograficos de Venezuela. By LISANDRO ALVARADO. 8×5½ inches. Pp. xx+412. Frontispiece. Biblioteca Venezolana de Cultura. Carácas : Escuela Tecnica Industrial, 1945.

By including in the series *Biblioteca Venezolana de Cultura* the ethnographical data compiled by Dr. Lisandro Alvarado (1858-1929), the Ministry of National Education at Carácas has provided a useful book of reference. The author was exceptionally gifted : as a member of the medical profession and humanitarian he applied his knowledge, particularly of psychopathology, to national as well as individual problems ; as an historian he applied scientific methods instead of romanticism ; as a linguist, he explored Indian languages and dialects and the modifications of Spanish in Venezuela. His ethnographical work was based on his studies in anthropology, sociology, folklore, and cognate subjects.

Much material is contained in the seventy-six chapters of this volume, which deals with the history, distribution, physical and mental characters, languages, customs, beliefs, and occupations of the Indian tribes of Venezuela. The value of the book is enhanced by copious bibliographical references and by the addition of indices. Unfortunately, there are no maps, and a portrait of the author is the only illustration.

J. H. K.

El Perú en Marcha : Ensayo de Geografía Económica. Demy 8vo. Pp. xxxvi+435. 29 plates. 46 tables. Lima : Banco de Crédito del Perú, 1943.

The publication of a substantial treatise on the economic geography of Peru is noteworthy. Individual chapters deal with physical and regional geography, social and economic history, agriculture and the live-stock industry, mineral resources and exploitation, and with the economic structure, relevant statistics and trends. There are many interesting photographs, but it is to be hoped that the omission of maps will be rectified in the revised edition in English to be published next year.

J. H. K.

AUSTRALASIA

Best Books on Australia and New Zealand : An Annotated Bibliography. By EVANS LEWIN, M.B.E. 8½×5½ inches. Pp. v+63. Royal Empire Society Bibliographies, No. 13. London : The Royal Empire Society, 1946. *Price* 4*s.*

Readers interested in Australasia will appreciate this annotated list of books, mostly published since 1900. Except in the fields of literature and economics, New Zealand has a relatively larger output of publications than Australia. The titles are arranged in sections (General and Descriptive, Bibliography and Literature, History and Biography, Discovery and Exploration, Administrative and Political, Economics, Education, Arts and Crafts, Geography and Physiography, Aboriginal Races, Zoology and Nature Study, Reviews and Journals). Six pages are devoted to books on Island Dependencies. The bibliography is intended for general reference, the more advanced student being referred to the subject Catalogue of the Royal Empire Society.

J. H. K.

GENERAL

Adventures by Sea of Edward Coxere. Edited by E. H. W. Meyerstein. Crown 8vo. Pp. xix+123. 4 illustrations. End-paper maps. Genealogy. Oxford : Clarendon Press, 1945. *Price 7s. 6d.*

This agreeable little book is the autobiography of a seaman of Dover who lived from 1633 to 1694. At an early age he became an expert sailor with a knowledge of navigation, and also acquired a colloquial mastery of French, Dutch, and Spanish, attainments which were to stand him in good stead. He was also a most engaging character, as the reader of his unassuming but vivacious tale soon realises. His voyages, sea-fights, imprisonments by the Spaniards, slavery under the Turks, and sundry other adventures make fine reading and give an excellent picture of life at sea in those stirring times. While still under thirty, Coxery (so apparently pronounced and sometimes spelt) became a Quaker. His latter years were clouded by persecution and imprisonment, and the concluding pages of his story take on the complexion of spiritual autobiography.

The spelling is mercifully modernised, but captivating specimens of the original orthography in the foot-notes make one almost wish it had been given entire. The introduction and notes illuminate the narrative and greatly enhance the value of the book.

H. C. M.

Charles Darwin and the Voyage of the 'Beagle.' Edited with an Introduction by Nora Barlow. Demy 8vo. Pp. 279. Frontispiece. 15 plates. Track chart. Map. Glossary. London : Pilot Press Ltd., 1945. *Price 15s.*

The voyage of His Majesty's ship *Beagle* round the world takes a high place among the really great voyages of history not because of its geographical or general scientific results, but because the ship's commander, Captain Fitzroy, shared his cramped cabin with a young naturalist, Charles Darwin. This was the same Darwin who nearly thirty years later wrote *The Origin of Species*, a book which more than any other influenced the thought of the last century and which still profoundly influences our own outlook on man and his problems. Darwin himself at the end of his life referred to the voyage as " the most important event of my life " ; we are grateful therefore to a grand-daughter of his, Lady Barlow, who has rescued from oblivion (some from a cupboard under the stairs at Down !) twenty-four little books full of notes made on his travels and over thirty as yet unpublished letters written to his family at this time. These, although they cover no new ground, give us a first-hand, fresh and detailed picture of Darwin himself in his formative period. We see him setting out, a young man of twenty-two, as diffident, easy-going and aimless as would be expected from his background sympathetically described in the author's opening chapters. He returns five years later a man who knows what he wants to do and how to do it. Within the next few years his publications include works on the geology and zoology of the voyage, the origin of coral reefs, a monograph on barnacles, and he is already working on his magnum opus—all these derived from and stimulated by the voyage.

Lady Barlow's editing of the new material and the carefully chosen illustrations and maps bring the younger Darwin back to us. We feel, in fact, at times we are peeping over his shoulder and occasionally are slightly ashamed to be doing so. It is not the elderly bearded and retiring Victorian we see here but an attractive, enthusiastic and adventurous scientist in the making. We quite understand now why his contemporaries, to use an expressive modern phrase, " had so much use for him," and we are grateful to the author for showing him to us.

G. F. F.

Let the Great Story be Told : The Truth about British Expansion. By H. Wood Jarvis. Foreword and Postscript by the Rt. Hon. The Lord Queenborough, G.B.E. Demy 8vo. Pp. xiv+304. London : Sampson Low, Marston and Co. Ltd., n.d. [1946]. *Price 18s.*

The main purpose of this book is to counter the proposition that Britain has acquired its Empire by brutal suppression of other peoples. While admitting the stark reality and the economic importance of the slave-trade, the author points out that we abandoned it earlier than other colonial powers, and he seeks to establish the view that mere aggression played a very small part in the foundation of the British Empire, which came into being despite the apathy or active opposition of one British government after another.

The book consists of a series of short biographies of some of " Englands' forgotten worthies." We have the stirring human story of plain John Smith of Virginia ; of Banks, the well-to-do naturalist, Cook's companion on his first voyage and a friend to all subsequent pioneers in the South Seas ; of Bass and Flinders, the explorers of New South Wales ; of Marsden and the Maoris ; of Raffles, the founder of Singapore ; of Wakefield and his beneficent ' irregularities ' ; and of others like these who, undismayed by the neglect, the downright obstruction and the hopeless lack of vision of men in high places, persisted in unselfish and heroic effort to realise dreams that after all are coming true.

North America, India and Malaya, Australia and New Zealand, South Africa are the

regions dealt with at length. A few notes on other parts of the Empire are given in an appendix. There is a bibliography of sources, with abundant references to them throughout the text. The book is supplied with an index but no maps.

Foreword and postscript are by Lord Queenborough; both are excellent. R. T. C.

It's Your Empire. By Alexander Campbell. Crown 8vo. Pp. 223. London: Victor Gollancz Ltd., 1945. *Price* 7*s.* 6*d.*

On page 151 of this book it is related that the Rajah of Kalicote, a staunch supporter of the British authorities, while on his way to a meeting of the National Defence Council, was ejected by Europeans from a first-class railway carriage, he being "black." Many at home and many Europeans in the Colonies and Dominions would regard that action as only right and proper, which seems to show that the Herrenvolk mentality is not a monopoly of one nation and that an urgent matter in the world to-day is the education of White as well as Black. Education in the widest sense of the term is a major theme in the book, which reviews political, social, and economic conditions prevailing in every part of the Empire where "coloured" people live. It insists upon the sound, devoted work of British colonial officials and upon their struggles against natural obstacles, including ignorance and inertia, against inadequate financial means and economic forces often actuated by greed. The avowed purpose of the book is to interest the public on the side of those officials.

Here and there many good things have been noted, but on the whole the book makes grim reading: the magnitude and the complexity of the problems to be solved are so vast, and everywhere the chief hindrance in the way of satisfactory solutions is what Mr. Churchill has called "the fierce self-interest of small white populations" that regard "natives" as merely purveyors of cheap labour.

There are no maps. Perhaps too many would have been required. R. T. C.

Best Books on the British Empire: A Bibliographical Guide for Students. By Evans Lewin, M.B.E. 8½×5½ inches. Pp. ii+100. Royal Empire Society Bibliographies, No. 12. London: The Royal Empire Society, 2nd ed., 1945. *Price* (paper covers) 4*s.*, (boards) 5*s.*

The Subject Catalogue of the Royal Empire Society contains some 3270 pages, so that a short and at the same time representative list of books dealing with the British Empire is acceptable. The student will find here a useful list, well arranged and with an index of authors, of books published in the English language since 1910 (with a few exceptions) and dealing with "the general description, administration, economics, history, and native races of the Dominions, Colonies, and India." Official reports, general works on travel, agriculture, mining, or specific products are not included. J. H. K.

A History of Medicine. By Douglas Guthrie, M.D., F.R.C.S.Ed., F.R.S.E. Demy 8vo. Pp. xvi+448. 72 plates. End-paper sketch-maps. Edinburgh and London: Thomas Nelson and Sons Ltd., 1945. *Price* 30*s.*

An outline of the history of the art and science of medicine would seem to be of primary interest to members of the medical profession and, after a cursory glance at this well-illustrated book, one might add, also to anthropologists. But there is a sketch-map showing some twenty-six places, from Jundi-shapur, the seat of a Sassanian university in south-west Persia, to Córdoba, centre of Arabian culture in the west, and from Alexandria, effulgent for a number of centuries, to Edinburgh. This map of cultural and medical centres, past and present, is a reminder that geography is closely related to history, and that there has been, as mentioned in the preface, a "geographical march of medicine," by routes which are explained in the text.

An appreciation of geographical aspects, including an account of medical men as explorers, is unusual in histories of medicine, but not surprising in the present instance when one realises that the author is not only a distinguished member of his profession but an experienced and observant traveller who has rendered significant services to the Royal Scottish Geographical Society. His volume is a treasury of information on the evolution of medicine from ancient times to the present day. It provides the general reader with interesting and readable fare, and a wide range of choice. There is, for instance, the strange story of the mandrake, or of an ointment made from unicorn's liver, an outline of medical ethics in Babylonia, J. Y. Simpson's prophecy of X-rays, the revolution in psychopathology initiated by Freud, the coming of communal medicine. Space does not permit more than a mere indication of the nature of the volume; the excellent index, of twenty-seven pages, prepared by Dr. J. C. Corson, will enable the reader to discover for himself many items of individual interest. This very fully documented work, with its remarkable illustrations, is definitely of interest to the 'general' reader who wishes to transfer his attention from the history of destruction to that of healing. It is of particular interest to readers in Scotland, for the Scottish contribution to medicine and its world-wide ramifications has not yet been integrated with our history lessons. J. H. K.

The Tourist Movement: An Economic Study. By Sir F. W. Ogilvie, M.A., LL.D. 8½×5½ inches. Pp. xv+228. Graphs. London: Staples Press Ltd., n.d. *Price* 14*s.*

This is a pioneer work of research into the economics of Tourism, a study of the statistical aspects of international tourist movements. A tourist is defined as a person who leaves home for business, religion, health, or any other reason, and returns home in less than a year, having spent on transport, maintenance and sundries money which was earned at home. Of all the countries in the world, the United States offers the best statistical returns for such a study; our own land, "the nation of shopkeepers, is already in large measure a nation of innkeepers (311,000 insured persons were actually in employment in 1930), but it knows little of it." Thus the author has ploughed his statistical way over a world-wide virgin field that offers little enough in the way of return, though perhaps he is preparing for a more productive crop in future years.

We require a Tourist Department to collect, sift, and publish statistics of tourist movements, many of which are already in government pigeon-holes. Meanwhile, in the case of Britain, Sir Frederick Ogilvie (whose Preface is dated 1933) must resort to mathematical methods of approximation, or to enumeration of averages, estimates, and guess-work. His results indicate that in 1929, a maximum year, United Kingdom tourists abroad are estimated at a million, their average length of stay is reckoned at twenty days, and their expenditure is over £32,750,000. For the same year, visitors to the United Kingdom numbered 692,000, stayed about twenty days, and spent £22,445,000. These are surprisingly large figures, and the debit balance of over £10,000,000 is disquieting. Perhaps this mere statement may stir our members to read this book, if only for its bearing on what must be part of the function of the Scottish Travel Association, established in 1930. We admire the patience and persistence of the author, we enjoy his quiet humour, and we hope that the world's governments will minister to his needs in the post-war labours he will surely undertake. J. H. B.

BOOKS RECEIVED

The Land of Britain: The Report of the Land Utilisation Survey of Britain. Edited by L. Dudley Stamp, B.A., D.Sc.

Part 20. *Renfrewshire.* By Morag D. Moyes, Ph.D. Pp. 259-288. 22 figs.

Part 21. *Lanarkshire.* By L. Dudley Stamp, B.A., D.Sc. Pp. 289-328. 29 figs.

Part 22. *County of Dumbarton.* By L. Dudley Stamp, B.A., D.Sc. Pp. 329-354. 20 figs.

Part 23. *Stirlingshire.* By L. Dudley Stamp, B.A., D.Sc. Pp. 355-378. 19 figs. 1946. *Price* (Parts 20-23) 4*s.*

Part 61. *Staffordshire.* By J. Myers, B.S. With an Appendix on the Black Country by S. H. Beaver, M.A. Pp. 567-652. 46 figs. 1945. *Price* 4*s.*

London: Published for the Survey by Geographical Publications Ltd.

Navegação de Paz e de Glória. By Dutra Faria. 9×6½ inches. Pp. 165. 4 photographs. Lisbon: Agência Geral das Colónias, 1945.

Colecção "Pelo Império": Indices (Nos. 1-100). By Manuel Ferreira. 7¾×5¾ inches. Pp. 127. Lisbon: Agência Geral das Colónias, 1945.

O Sertanejo do Bié (Silva Pôrto). By Carlos Parreira. 7¾×5¾ inches. Pp. 24. Portrait. Colecção Pelo Império, No. 110. Lisbon: Agência Geral das Colónias, 1945.

Freire de Andrade. By Carlos Portugal Ribeiro. 7¾×5¾ inches. Pp. 51. Portrait. Colecção Pelo Império, No. 111. Lisbon: Agência Geral das Colónias, 1944.

O Capitão-Mór D. Gonçalo de Silveira. By José Gervasio Leite. 7¾×5¾ inches. Pp. 67. Colecção Pelo Imperio, No. 112. Lisbon: Agência Geral das Colónias, 1945.

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Property Rights of Soviet Citizens. By Mikhail S. Lipetsker. Crown 8vo. Pp. 45. London: Soviet News, 1946. *Price* 1*s.*

Labour Protection and Accident Prevention in the U.S.S.R. By N. Alexandrov. Crown 8vo. Pp. 44. 18 photographs. London: Soviet News, 1946. *Price* 1*s.*

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Soviet Music: Musical Education and Music Making. By BORIS YAGOLIM. Foreword by Sir George Dyson. Crown 8vo. Pp. 72. 24 photographs. London: Soviet News, 1946. *Price* 1*s.*

Doutrina Cristã em Língua Concani, por TOMÁS ESTÊVÃO, S.J. Printed in Rachol (Goa) in 1622. Second (facsimile) edition, with an introduction, notes, and glossary, by MARIANO SALDANHA. 8¾×6¼. Pp. xii+267. Frontispiece. Lisbon: Agência Geral das Colónias, 1945.

Chungking Diary. By ROBERT PAYNE. Crown 8vo. Pp. vi+526. Frontispiece. London: William Heinemann Ltd., 1945. *Price* 12*s.* 6*d.*

O Negro de Menongue (Notas Antropológicas e Etnográficas). By ALEXANDRE SARMENTO. 8½×6 inches. Pp. 91. Lisbon: Agência Geral das Colónias, 1945.

Physical Geography of the Canadian Eastern Arctic. Demy 8vo. Pp. 10. 1 map. Reprinted from *The Canada Year Book, 1945.* Ottawa: Edmond Cloutier, King's Printer, 1945.

Houses and House Use of the Sierra Tarascans. By R. L. BEALS, P. CARRASCO, and T. MCCORKLE. Crown 4to. Pp. 37. 8 plates. 20 figs. Smithsonian Institution, Institute of Social Anthropology, Publication No. 1. Washington, D.C.: U.S. Government Printing Office, 1944.

Cherán: A Sierra Tarascan Village. By RALPH L. BEALS. Crown 4to. Pp. 225. 8 plates. 19 figs. 5 maps. Smithsonian Institution, Institute of Social Anthropology, Publication No. 2. Washington, D.C.: U.S. Government Printing Office, 1946.

Strategic Colonies and their Future. Papers prepared for the FABIAN COLONIAL BUREAU. Introduction by A. CREECH JONES, M.P. 8½×5½ inches. Pp. 36. 2 sketch-maps by J. F. Horrabin. London: Fabian Publications Ltd., and Victor Gollancz Ltd., 1945. *Price* 1*s.* 6*d.*

Living on a Planet. By Professor C. A. COTTON. 8½×5½ inches. Pp. 47. 23 figs. Christchurch, N.Z.: Whitcombe and Tombs Ltd., 1945. *Price* 2*s.* 6*d.*

Climate and the Energy of Nations. By S. F. MARKHAM. 8½×5½ inches. Pp. x+236. 23 graphs and sketch-maps. London: Oxford University Press, 1944. *Price* 18*s.*

Our Insect Friends and Foes and Spiders. By various authors. Foreword by Dr. Gilbert Grosvenor. 10×7 inches. Pp. 252. Photographs. 64 coloured plates. Washington, D.C.: National Geographic Society, 1935. *Price* $2.50.

The Book of Fishes. Revised and Enlarged Edition, Presenting the Better Known Species of Food and Game Fishes of the Coastal and Inland Waters of the United States. Edited by JOHN OLIVER LA GORCE, Litt.D., D.Sc. 10¼×7 inches. Pp. 367. 443 coloured illustrations. 162 photographs. Washington, D.C.: National Geographic Society, 1939. *Price* $3.50.

ROYAL SCOTTISH GEOGRAPHICAL SOCIETY

PROCEEDINGS

MEETINGS OF COUNCIL were held on April 2nd, May 28th, and July 16th, 1946.

Awards.—The Society's Research Medal was awarded to MARCEL AUROUSSEAU, Secretary of the Permanent Committee on Geographical Names, for his valuable research upon the subject of nomenclature and on the proper transliteration of names from a wide variety of languages.

The Bruce Memorial Prize was awarded to Lieut.-Col. P. D. BAIRD for his valuable survey and geological work with Mr. J. M. Wordie in North West Greenland and Baffin Island in 1934, and with Mr. T. H. Manning's British Canadian Arctic Expedition in 1936-37, and subsequent exploration in northern Baffin Island and Bylot Island.

The Scottish Universities Medal was awarded to AGNES M. MAXWELL, First in Geography (First Course), 1943-44, and highly placed in all subsequent Courses, 1944-46, Edinburgh University; ISOBEL PIRIE THOMSON, First Place, Ordinary Class, 1945-46, Aberdeen University.

The Society's Badge.—To conform with the wishes of the Lord Lyon King of Arms, and in order to register the badge as a heraldic design with the Court of the Lord Lyon, a slight alteration was made in the design of the Society's badge.

OBITUARY

It is with poignant regret that the death has to be recorded of JOYCE U. DOUGLAS, a friendly personality and geographer of high promise who was awarded the Society's Scottish Universities Medal (Edinburgh University) for 1944-45.

LECTURE SESSION, 1946-1947

October—December 1946

EDINBURGH, *Usher Hall.*

EVENING MEETINGS, at 7.30 p.m.

October 17th, 1946.—The Rt. Hon. Lord WAKEHURST, K.C.M.G., on "Australia." Slides and film.
November 14th.—Sir BASIL J. GOULD, C.M.G., C.I.E., on "The Enthronement of the Dalai Lama." Film.
December 12th.—Wing-Commander D. C. MCKINLEY, D.F.C., A.F.C., on "Royal Air Force North Polar Investigation Flights." Illustrated.

Lothian Road Church Hall.

AFTERNOON MEETINGS, Wednesdays, at 3 p.m.

October 23rd, 1946.—Miss IDA M. HAYWARD, F.G.S., on "The Seasons in the Borderland from an Artistic Point of View." Coloured film.
November 6th.—GEORGE WATERSTON, M.B.O.U., on "Fair Isle." Illustrated.
November 20th.—JOHN S. CLARKE, J.P., on "The Romance of the Clyde from Source to Sea." Illustrated.
November 27th.—Miss AMY J. ATKINSON, on "Across Europe—From the Hook to Budapest." Illustrated.
December 4th.—GEORGE W. WIGHT, I.S.O., on "Tweed, from Source to Sea." Illustrated.
December 18th.—JAMES L. HARRISON, I.F.S., M.I.B.A.E., on "Some Aspects of a Forest Officer's Life in India." Illustrated.

Synod Hall.

FILM SHOWS FOR YOUNG PEOPLE, at 10.30 a.m.

December 21st, 1946.—"Scotland To-Day."
December 27th.—"Our Food Problem."

GLASGOW, *Lyric Theatre*, at 3 p.m.

October 17th, 1946.—The Rt. Hon. Lord WAKEHURST, K.C.M.G., on "Australia." Slides and film.
November 14th.—Sir BASIL J. GOULD, C.M.G., C.I.E., on "The Enthronement of the Dalai Lama." Film.
December 12th.—Wing-Commander D. C. MCKINLEY, D.F.C., A.F.C., on "Royal Air Force North Polar Investigation Flights." Illustrated.

ABERDEEN, *Natural Philosophy Class Room*, at 7.30 p.m.

October 15th, 1946.—Lieut.-Colonel F. G. PEAKE, C.M.G., C.B.E. (Peake Pasha), on "The Land and People of Transjordan." Illustrated.
November 12th.—GEORGE WATERSTON, M.B.O.U., on "Fair Isle." Illustrated.
December 10th.—ALAN C. BROWNE, F.R.G.S., A.R.C.A., on "New Zealand." Hand-coloured lantern slides.

DUNDEE, *Training College Hall*, at 7.30 p.m.

October 16th, 1946.—Lieut.-Colonel F. G. PEAKE, C.M.G., C.B.E. (Peake Pasha), on "The Land and People of Transjordan." Illustrated.
November 13th.—GEORGE WATERSTON, M.B.O.U., on "Fair Isle." Illustrated.
December 11th.—ALAN C. BROWNE, F.R.G.S., A.R.C.A., on "New Zealand." Hand-coloured lantern slides.

NOTICE

THE SCOTTISH GEOGRAPHICAL MAGAZINE.—Owing to the reconstitution of libraries after the war, the demand for entire sets of the Magazine is likely to be increased. It is desirable, therefore, to complete a number of sets by obtaining the following issues which are out of stock :—Vol. 35, Edinburgh Number (1919) ; Vol. 37, Glasgow Number (1921) ; Vol. 52, Nos. 4 and 5 (1936) ; Vol. 58, Nos. 1, 2 and 3 (1942) ; Vol. 59, Nos. 1 and 2 (1943) ; Vol. 60, No. 2 (1944) ; Vol. 61, Nos. 1, 2 and 3 (1945).

Will members who are able to spare any copies of these numbers very kindly forward them to the Secretary.

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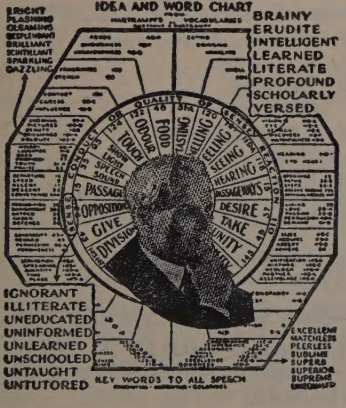

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